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ZINC

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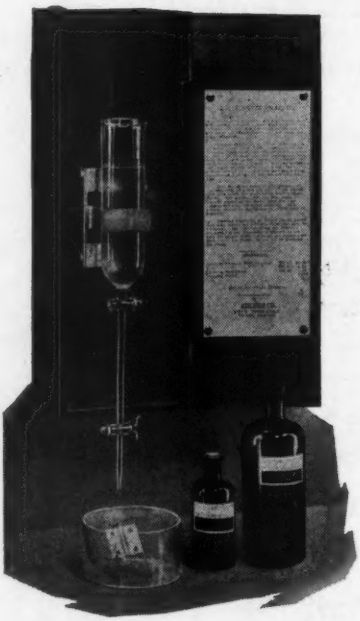

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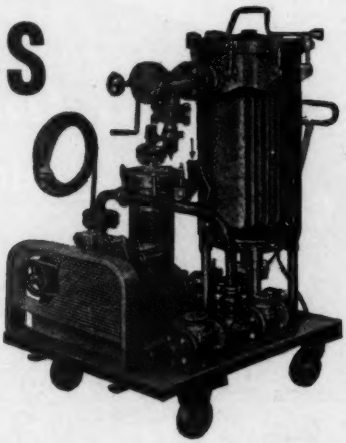

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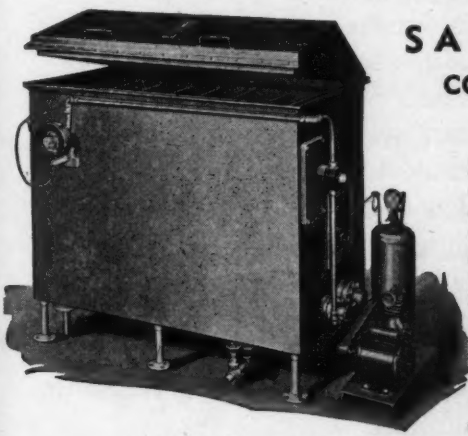

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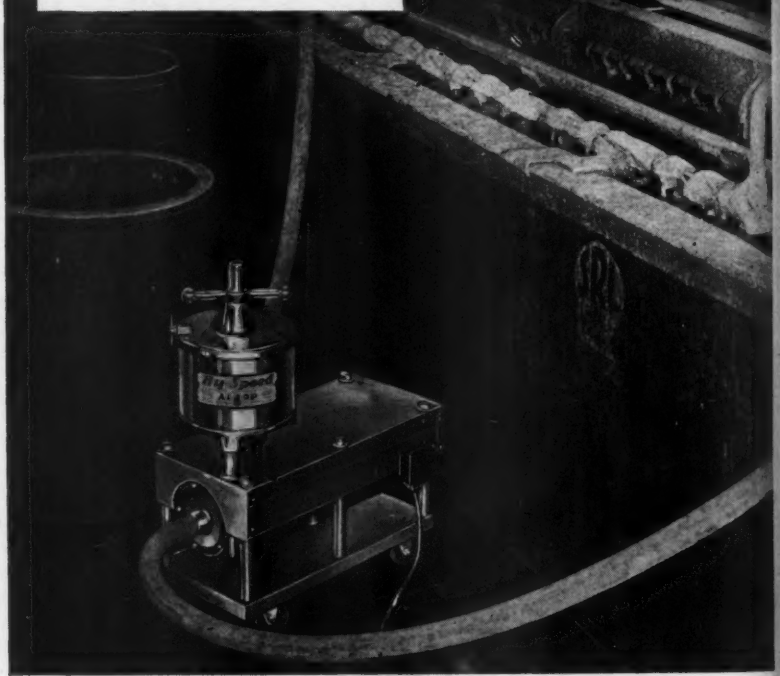
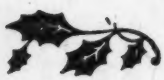


THE MONTHLY REVIEW



Season's Greetings

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By E. T. CANDEE

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When the war was declared, there was an immediate upsurge in business, and many companies who made a highly specialized product and were equipped to finish that product only, suddenly had to set up to manufacture all sorts of equipment which could not be finished in their automatic production equipment. In other cases special finishes were required with which they were not familiar, and in order to expedite deliveries they had to have the work done by people who were equipped. The shortage of materials and the efforts of W.P.B. to use all facilities before any new equipment was allocated, forced these companies to hunt around for others equipped to do the finishing. All of these brought to the attention of industry that a Job Plating Industry existed and was in a position to produce finishes economically, to specification and to make prompt deliveries. Due to the very nature of the Job Plating Industry, they have had to maintain the maximum of flexibility of equipment and thus can change from the finishing of one article to another with a minimum of delay and disruption of their plant.

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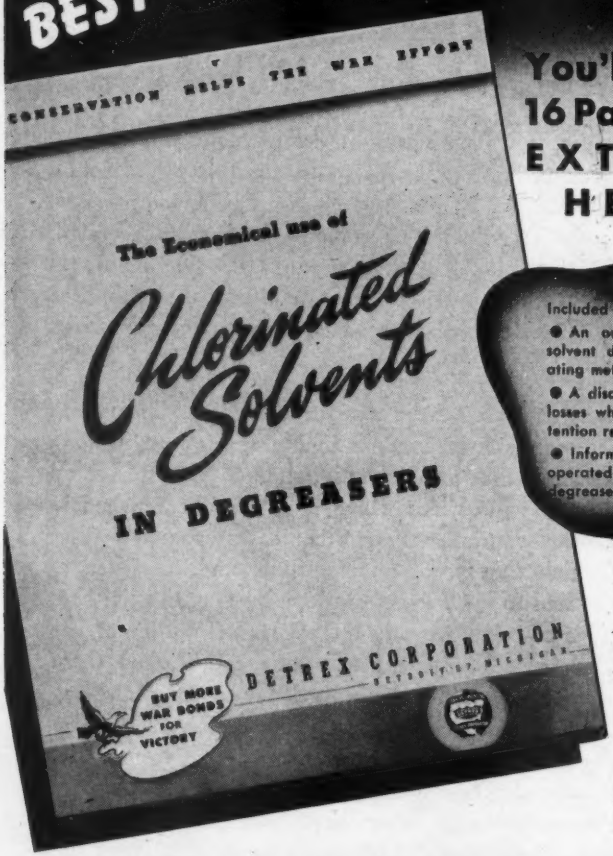

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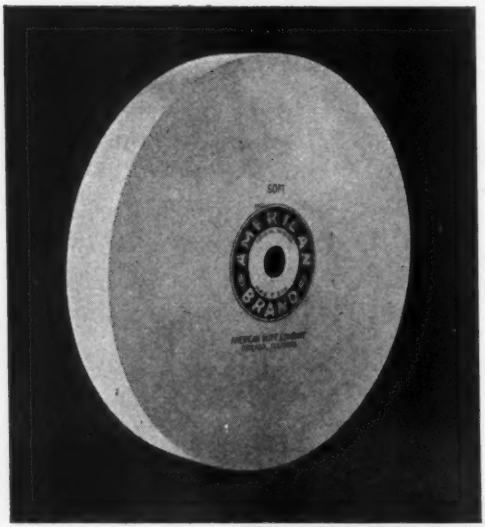

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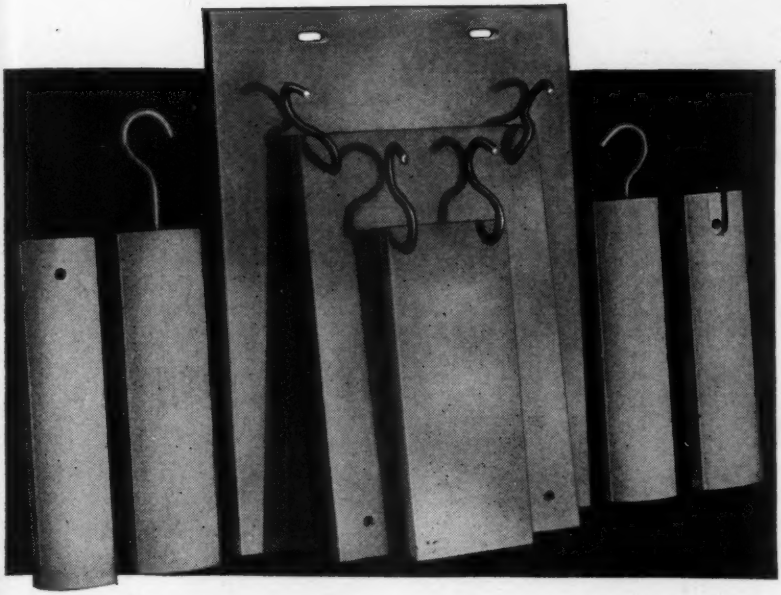

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The Fundamentals of Chemistry for Electroplaters

Part II. The Fundamental Laws of Chemical Combination

By SAMUEL GLASSTONE, D.Sc., Ph.D.

THE LAW OF CONSERVATION OF MASS

FOUR simple laws govern the combination of elements to form compounds, and these may be regarded as the fundamental laws of chemistry. Without them the development of chemistry to the science that it is today would not have been possible. These laws or generalizations represent the results of numerous experiments; they are not merely theories, they are to be regarded as statements of fact. The word "law" is not used in science to imply an edict based on authority, but rather as a summary or generalization of results obtained by actual experiment.

The first and simplest of the laws to be considered is known as the "law of conservation of mass," according to which the total mass (or weight) of a reacting system is unchanged as the result of a chemical reaction. In other words, when a chemical change takes place, e. g., the combination of elements to form a compound, the total mass of the substances taking part in the reaction is equal to the total mass of the resulting products. The law of conservation of mass has sometimes been stated in the form that matter can neither be created nor destroyed, although it can be changed into another kind by means of a chemical reaction. The possibility of being able to represent chemical changes in the form of equations, as will be seen later, is based on the constancy of mass. In the early development of chemistry it appeared that there might be exceptions to the law. For example, if a metal such as tin or iron or copper is heated in air it increases in weight. The reason for this increase is now known to be due to the fact that when the metal is heated it combines with the oxygen of the air to form a compound known as an oxide. The increase in weight is exactly equal to the weight of oxygen taken up from the air. In spite

of numerous tests of the greatest accuracy, no exception to the law of conservation of mass has been found.

THE LAW OF CONSTANT PROPORTIONS

The second of the fundamental generalizations is the "law of constant proportions," also known as the "law of definite proportions;" this states that a given chemical compound always contains the same elements united in the same proportions by weight. The importance of this law lies in the fact that it tells us that a given chemical compound is something very definite, always having a constant composition that is independent of the method, time or place of its preparation. For example, the compound of copper and oxygen known as cupric oxide can be made in several ways, of which two are as follows: the finely powdered metal may be heated in oxygen, or the metal may be dissolved in nitric acid and the resulting solution, containing the compound copper nitrate, evaporated to dryness and then heated strongly to bring about decomposition. In each case, the resulting cupric oxide, irrespective of the method by which it is made, is found to contain 79.9 per cent by weight of copper and 20.1 per cent of oxygen. The copper oxide has thus a definite and constant composition, and the same has been found true for all chemical compounds. It is unnecessary to emphasize the importance of the law of constant proportions, for it means that when a given substance is specified, for example as the constituent of a plating bath, it will be the same, apart from possible impurities, anywhere in the world.

THE LAW OF MULTIPLE PROPORTIONS

The third law of chemical combination deals with the possibility that two elements may unite to form more than one compound; for instance, the elements copper and oxygen combine to produce two quite different substances, each having a definite and constant composition, which is however different for the two compounds. These two oxides are distinguished by the names cupric oxide, referred to above, and cuprous oxide. Iron and oxygen form at least three different compounds, while some pairs of elements may form as many as five or more. The "law of multiple proportions" is a statement of the relationship between the compositions of the different compounds obtained from the same two elements. It says that if two elements A and B combine to form more than one compound, then the different

amounts of A that unite with a definite amount of B bear a simple ratio to one another. The law of multiple proportions may be illustrated by reference to the two oxides of copper; the compositions by weight, and the amounts of copper that combine with one part of oxygen in each case are given below. The amounts of copper that unite with

	Copper	Oxygen	Copper	Oxygen
Cupric oxide	79.90%	20.10%	3.975	1.000
Cuprous oxide	88.82%	11.18%	7.950	1.000

the fixed weights of one part of oxygen are 3.975 and 7.950, and these are obviously in the simple ratio of 1 to 2, in accordance with the law of multiple proportions.

THE LAW OF COMBINING PROPORTIONS

The fourth and last of the fundamental laws to be mentioned here is the "law of combining proportions." From a study of the compositions of numerous compounds, it has been found that when elements unite with one another they do so in terms of a definite weight, which has been called the "combining weight" or, more generally, the "equivalent weight." The law of combining proportions states that when elements combine with one another they do so in proportion of their combining weights, or equivalent weights, or in simple multiples of these weights. For the purpose of expressing the combining weights numerically, it is necessary to fix upon a standard of reference; this is taken as 8.000 parts by weight of oxygen. The equivalent weight of an element is then defined as the number of parts by weight of that element which will combine chemically with, or will replace from chemical combination, 8.000 parts by weight of oxygen. The equivalent weights of a number of common elements are given below.

EQUIVALENT WEIGHTS OF COMMON ELEMENTS

Aluminum	9.0	Iron	27.9
Cadmium	56.2	Lead	103.6
Chlorine	35.5	Nickel	29.35
Chromium	8.67	Oxygen	8.000
Cobalt	29.5	Silver	107.9
Copper	31.8	Sodium	23.0
Hydrogen	1.008	Zinc	32.7

According to the law of combining proportions, these numbers, or simple multiples thereof, give the proportions in which various elements combine with each other. For example, water consists of 1.008

parts by weight of hydrogen and 8.000 parts of oxygen; sodium chloride is made up of 23.0 parts of sodium and 35.5 parts by weight of chlorine; cupric oxide has 31.8 parts of copper and 8.000 parts of oxygen, and so on.

When a given element forms two or more compounds with oxygen, the equivalent weights, as defined above, must differ in the various compounds. From the compositions of the two oxides of copper given previously, it can be readily calculated that in cupric oxide 31.8 parts of copper combine with 8.000 parts by weight of oxygen, whereas in the cuprous oxide 63.6 parts of copper are united with that weight of oxygen. The equivalent weight of copper in cupric oxide, and in all of its cupric compounds, is 31.8, while in cuprous oxide, and in all cuprous compounds, it is 63.6. Although these two numbers are different, they bear a simple ratio to one another, the latter being twice the former. This is, of course, in agreement with the law of multiple proportions, as well as with the law of combining proportions.

The foregoing laws of chemical combination have had a profound influence on the development of chemistry, and in the next article it will be shown how they have led to the idea of the atom as the unit of chemical combination.

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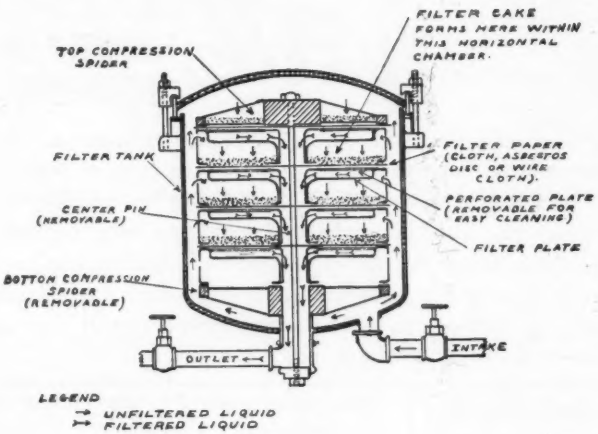

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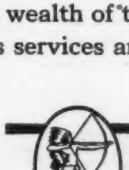

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Papers Sought for 1944 Convention

The Educational Committee of the Cleveland Branch wish to extend a cordial invitation to the members of the Society who desire to present a paper at the 1944 Convention in June.

We wish to limit the papers to (20) twenty. The first twenty papers received, reviewed and approved by the Supreme Society and the Cleveland Committee will be presented at the convention.

All papers must be in our hands for preprinting and review not later than April 15th, 1944.

No more than (1) one paper shall be accepted for presentation from any one company.

No promotional papers will be accepted. We hope to confine all presentations to practical or technical subjects which will be appreciated and understood by the greatest number of members.

We especially invite papers from individual members. If editorial assistance is required prior to presentation; the committee will be pleased to help and advise.

In conclusion, please remember this is your Society; if you have ideas or information of value they will be cordially received. The program depends on your individual efforts, support it by worthwhile contributions.

CLEVELAND COMMITTEE,

JOHN A. HONNECKER, *Chairman*,
2030 Revely Ave.,
Lakewood, 7, Ohio

COSTLY COST EXPERIENCES

By BERT SAGE
Waterbury Branch

IN the Post War period or Reconstruction Era which we hope is not too far away, we all are wondering what part the Plating Industry will play especially in view of the fact that new materials have come into use during the war and will become competitive with plating metals. Some of these materials will displace metals but may require plating in their production; other materials may require new finishing techniques. We can be pessimistic or optimistic about the future depending upon the way you want to look at it. Regardless of the new materials which will eliminate metals or which require new finishing techniques, the one fact upon which our future depends is our ability to produce finishes at a low cost and produce finishes which perform well.

Costs in the Plating Room are determined by the equipment available, the methods with which the equipment are used, and the care with which the department is maintained. These things require close cooperation and understanding between the Cost Department, Engineering Department, Methods Department, and Plating Department. The Foreman of the Plating Department should make sure that the chemical terms, electrical terms, and other terms peculiar to the plating fraternity are understandable to all the other departments so that their advice may be used as much as possible. The war has shown that the old fashioned idea of getting by with what we have and as long as the cover is good, is out because the competitive materials make it imperative that the finishes are put on economically and put on so that they will last for the life expectancy of the product. If plating is not done correctly the pessimist will have justification in his attitude. Possibly an illustration of misunderstanding between the Cost Department and the Plating Department will illustrate what can happen when cost figures are not accurate.

A large company who is in the job plating business obtained a contract to plate a part with .001 ins. of Nickel and .0001 ins. of Chromium; the cost estimates in the Polishing Dept. were based on handling plus overhead basis; while the plating room costs were based on a cost .025 cents per .001 ins. of Nickel deposited per sq. ft.

This simplified the cost accounting method because they merely

had to calculate the surface area, multiply it by the factor .025 cents per square foot, and they had the cost of plating .001" of nickel. They also kept track of all materials used in the Plating Room and then to average about .020 cents per square foot, and thus they determined an overall cost of .045 cents per square foot for nickel plating. As long as the parts were of comparable size, this method worked out satisfactorily and no attention was put to the various problems of the plating foreman or his recommendations as to better methods of cost accounting.

One particular part came into the plating room to be finished in the shape of an "L" and in order to get .001" nickel minimum it was decided that they would have to put .0015 average deposit on the part. To the Cost Department this should mean a 50% increase in the cost of plating or a cost of .0675 cents per square foot. (This case occurred before the advantages of shielding and intermediary anodes were fully understood and appreciated.) It was found after plating started that the 50% increase in plating was inadequate as micro examinations showed that there was about 10 to 1 ratio between the High Current Density and the Low Current Density Areas. Actual figures showed that the High Current Density Areas had .003" nickel whereas the Low Current Density had between .0003" and .0004".

After producing these parts for one month it was found that the finishing profit turned out to be a loss of $3,000. The second month due to increased production, the loss was $7,000. These serious financial losses necessitated a thorough investigation of all factors of the finishing to determine the cause of the excess cost. While this investigation was going on, the third month's work was completed with a loss of $10,000. After checking everything, including generator current, area plated, current distribution, and several conferences, the difficulty was finally located. The Cost Department had retained their original figure of .045c per square foot for plating and did not realize that plating at 60 amperes per square foot for 30 minutes in order to deposit adequate plate to meet the specification required a 50% increase for plating materials and anodes. Thus the plating cost was increased from 50% over the .045c figure or increased by .0225c. From these figures it is quite easy to calculate the number of parts plated and what the losses would have been after several months.

The outcome of such an experience was fortunate in that the prime contractor was approached and the situation explained whereupon they

were willing to pay for the added deposit and thus it was possible to complete the contract at a fair margin of profit. This illustrates the importance of cost accounting in a Plating Department and the necessity for the foreman plater to be familiar with cost accounting methods and the equal importance for the Cost Department to be familiar with plating methods for processes.

With all the new plating processes which are being developed, the new materials which will be required, and the new types of things which will have to be finished in the Finishing Department, it becomes increasingly necessary for us to have a clear understanding of cost and cost accounting. We must always be on the lookout for methods of cutting costs without cutting quality, and this understanding and close cooperation between departments will be of the greatest help for this sort of work.

The chief reason for writing up the experience given in great detail is that I feel that such experiences which are encountered in the finishing departments and which are solved will be of great help to other members of the Society. I would like to recommend that a department be established in the MONTHLY REVIEW where problems of either how to plate, how to handle materials, how to determine cost, how to set up test procedures, or any other problem which has been encountered and solved, can be written up and detailed for the benefit of all members. If the idea is agreeable to the members and they will contribute, I feel that would be a definite contribution to the information exchanged between members of the Society.

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UNUSED PROCEEDINGS NEEDED

Members having unused copies of 1940 Proceedings and for previous years are urgently requested to send them to National Headquarters.

We receive numerous requests for back copies and our own files are reduced to single copies only for past years.

The information contained in the Proceedings is valuable and if your copy has served its purpose you can greatly help others by sending it in. Thank you for your help and cooperation.

ARMY AIR FORCES
NAVY BUREAU OF AERONAUTICS
AIRCRAFT RESOURCES CONTROL OFFICE
—AIRCRAFT PRODUCTION BOARD—W. P. B.

Operating Committee on Aircraft Materials Conservation

October 28, 1943

CONSERVATION BULLETIN NO. 6A

(This Conservation Bulletin No. 6A replaces Bulletin No. 6 "Conservation of Cadmium" issued July 30, 1943.)

These conservation bulletins are prepared by the Operating Committee on Aircraft Materials Conservation and are designed to call to the attention of the aircraft industry general conservation problems and questions that require industry-wide support and action.

SUBJECT: USE OF ZINC PLATING AS SUBSTITUTE FOR CADMIUM PLATING

1. *The Cadmium Situation*

The most recent survey by the War Production Board indicates that the cadmium supply will not be sufficient to meet all future requirements. The aircraft industry uses approximately 50% of all cadmium consumed and directive 5B outlines the cadmium conservation measures to be taken by the aircraft industry.

It is recognized that the problems involved in changing from cadmium to zinc plating are sometimes difficult and this bulletin is prepared to assist the aircraft industry in converting from cadmium to zinc plating. It would of course be much simpler if no conservation of cadmium were necessary but the problem exists and the aircraft industry must do its part in this program as it has met other similar troublesome material changes. The utmost cooperation of the industry is required and it is believed that substitutions that can be readily effected at this time will obviate the necessity for more drastic and less desirable action in the future.

2. *Comments on Value and Use of Cadmium and Zinc Coatings*

Competent tests have established that zinc coatings are either equal to or slightly superior to cadmium coatings of equal thickness as a protection against exposure to weather in industrial, suburban, rural and seacoast atmospheres.

Cadmium is definitely superior to zinc of the same thickness when subjected to extended salt spray or to intermittent submersion in salt water. Such exposure conditions require the use of heavier zinc coatings.

Resistance to salt spray, as in the standard salt spray test, is by no means a measure of resistance to atmospheric corrosion. Results from this test are applicable only under such service conditions as described in the preceding paragraph.

Where electrical grounding is involved, zinc may not make a satisfactory substitute for cadmium since the electrical contact resistance of a zinc plated surface

is higher than that of a cadmium plated surface. Lead plating is satisfactory in this respect, but lead should not be used in contact with aluminum, magnesium or zinc. Substitution of either lead or zinc for cadmium in applications involving electrical grounding must be approved by the Procuring Agency (Army Air Forces, Materiel Command, Wright Field, Dayton, Ohio; Navy Bureau of Aeronautics, Washington, D. C.).

Caution must be used in plating parts such as springs and lock washers of high or medium carbon steel and subjected in service to significant alternating stresses. It has been reported that zinc cyanide baths cause injurious hydrogen embrittlement in such cases, although acid zinc baths and some proprietary baths appear to be satisfactory.

Zinc gives satisfactory service in contact with aluminum and its alloys, and protects aluminum from corrosion in the same way that it protects steel.

Zinc plating does not result in higher "build-up" than does cadmium on protruding edges such as on screws and bolts. Where more "build-up" takes place in zinc plating than in cadmium, it is because the zinc plating solution or plating conditions have not been properly selected or controlled.

Zinc plating is considered unsatisfactory in some applications where corrosion products which may be formed from zinc coatings may interfere with the normal functioning of the part or affect adjacent parts. (For this reason magneto and carburetor parts, for example, are permitted to be cadmium plated in Directive 5B.) The formation of white corrosion products on zinc plating may however be prevented or significantly retarded through suitable treatments as specified in amendment 2 of specification AN-P-32.

Supplies of zinc for purposes of substitution for cadmium in plating are adequate and permitted by the latest revision of W.P.B. Zinc Conservation Order M-11-b.

2. *Factors Involved in Converting from Cadmium to Zinc*

In connection with any changes from cadmium to zinc, the applicable specifications must be considered. These Army-Navy-Aeronautical specifications, AN-P-32, Zinc Plating and AN-QQ-P-421, Cadmium Plating, have been revised and accept minimum plating thicknesses of 0.0003″ for cadmium and 0.0005″ for zinc plating. These specifications also accept a thickness of 0.0002″ for both zinc and cadmium on articles having integral parts which are threaded externally where the threads are a major portion of the article, and on parts where dimensional tolerances will not permit a coating of 0.0003″ cadmium or 0.0005″ zinc. They set no requirement as to thickness of plating for holes, recesses, internal threads and other areas where deposits cannot be adequately controlled under normal plating conditions. Except for platings of 0.0005″ or greater in thickness, specification AN-P-32 covering zinc plating does not require that parts be subjected to the salt spray corrosion test when zinc plated. In addition a plating thickness of 0.0002″ is acceptable on steel washers, nuts, bolts, screws and studs, and will be allowed for other similar items of aircraft hardware where the specified thickness requirement may cause serious production delay. Strict adherence to specification requirements as outlined above should result in substantial savings of cadmium.

Among the other factors to be reviewed in converting from cadmium to zinc are the following:

Equipment requirements for zinc and cadmium plating differ in several respects. When a change is to be made, delay will usually be avoided through

a careful check of the cadmium plating equipment available inasmuch as plating equipment is frequently not operated to maximum capacity, and estimates of additional requirements in changing from cadmium to zinc should not be based on previous output of cadmium plating but rather on the maximum plating capacity of the equipment available.

For equal thicknesses of cadmium and zinc (0.0002" cadmium to 0.0002" zinc) about a 60% increase in current and barrel capacity are required to maintain equal production.

Where necessary to increase thickness from 0.0003" cadmium to 0.0005" zinc, an increase of 165% in electric current is required to maintain the same volume of production. Also the parts falling into this category are predominantly still tank plated and an increase of about 50% is necessary in tank capacity.

In general:

(1) The same cleaning and plating equipment and procedures used in cadmium plating are used in zinc plating;

(2) The labor requirement will not change materially;

(3) Rectifiers to meet increased requirement of direct current are available with little delay in delivery;

(4) Rearrangement of available electrical equipment may greatly reduce the need of additional equipment;

(5) Converting the cadmium solution and anodes for zinc plating need involve no great difficulties if the simple precautions given below are taken.

3. *Suggested Procedure in Converting Facilities*

Inasmuch as there has been considerable discussion of the problems involved in converting from cadmium to zinc plating the following suggestions may be helpful:

(1) Remove the anodes from the tank. If ball anodes are used, empty the containers and hang them back on the anode rods.

(2) Connect the anode rods to the tank itself and continue cadmium plating as usual until (a) the tank sides and ball anode containers are stripped of any adherent cadmium (this is important to prevent contamination of the zinc solution), and (b) until the quality of the cadmium plate deteriorates below a point of acceptability (use of progressively lower current densities will extend this time period and should be used when production schedules permit). Store or dump the solution as is the more desirable in each individual case.

(3) Clean the tank and anode containers by scrubbing with water. Chisel off any remaining cadmium or dissolve it with some dilute nitric acid, but do not burn or melt it off (cadmium fumes are a deadly poison). Use the same precautions with plating barrels.

(4) Prepare a fresh zinc cyanide solution and place the necessary zinc anodes in the tank.

If after converting the equipment, it is found that cadmium anodes on hand are in excess of three months supply, sell them to the Metals Reserve Company through its agent, the Udylite Corporation, Detroit, Michigan.

OPERATING COMMITTEE ON
AIRCRAFT MATERIALS CONSERVATION

ARMY AIR FORCES
NAVY BUREAU OF AERONAUTICS
AIRCRAFT RESOURCES CONTROL OFFICE

—AIRCRAFT PRODUCTION BOARD—W. P. B.

Operating Committee on Aircraft Materials Conservation

CONSERVATION DIRECTIVE NO. 5B, APPROVED October 28, 1943

(This directive 5B replaces directive 5A approved May 10, 1943. See Section 9 for changes)

This directive, as amended, prepared by the Operating Committee on Aircraft Materials Conservation, was approved on the above date by joint action of the Army Air Forces, Navy Bureau of Aeronautics, and Aircraft Resources Control Office, Aircraft Production Board, and shall become effective upon promulgation.

SUBJECT: CONSERVATION OF CADMIUM

1. *Shortage of Cadmium*

The supply of cadmium that is or will be available is inadequate to meet the requirements of the military Services, and that portion of the available supply allocated to aircraft is not sufficient to warrant use of cadmium plating in applications where zinc, lead or other alternative surfacing materials make satisfactory substitutes.

Conversion from cadmium plating is to be accomplished with minimum delay after it has been established that zinc, lead or other coatings can be satisfactorily substituted.

Directives and other instructions providing for substitution of other materials, primarily zinc, for cadmium in plating, previously issued by the Army Air Forces, and Navy Bureau of Aeronautics, as well as Directive No. 5A of the Operating Committee on Aircraft Materials Conservation, are hereby cancelled and superseded by this Directive No. 5B.

2. *Specific Permissible Applications for Cadmium*

(a) Where designated by drawings and specifications as approved by the Procuring Agencies (Army Air Forces, Materiel Command, Wright Field, Dayton, Ohio; Navy Bureau of Aeronautics, Washington, D. C.) cadmium may be used for plating as follows:

(1) Aircraft bolts, nuts, screws, and washers except self-locking nuts limited by design to applications under 250° F.,
(2) Carburetor and magneto parts,
(3) External parts of engines for combat aircraft not including attachments such as clips, clamps, and lugs which are not incorporated in the engine proper,

(4) Parts which in service reach a temperature of 500° F. or higher; or come into contact with other parts which reach that temperature,
(5) Parachute, safety belt, shoulder harness and bomb sling hardware,
(6) Grounding contacts such as washers, and other electrical contacts when the increased electrical resistance of zinc plated surfaces would be objectionable.

3. *Specific Non-Permissible Applications for Cadmium*

(a) Cadmium shall not be used, regardless of specification or drawings, except upon certification of engineering necessity by the Procuring Agency for:

(1) Propeller parts, except where electrical contact may necessitate the use of cadmium,
(2) Landing gear parts,
(3) Self-locking nuts limited by design to applications not exceeding 250° F.,
(4) Fittings,
(5) Brackets,
(6) Tools,
(7) Cowl fasteners,
(8) Ignition harnesses except where electrical contact may necessitate the use of cadmium,
(9) Hydraulic actuating cylinders,
(10) Vibration insulators as used for engine or equipment mounting,
(11) Other parts as may be specified in future revisions to this directive.

4. *Conversion from Cadmium in Applications Not Listed Above*

(a) Zinc or other acceptable coatings other than cadmium may be used for exterior parts of amphibian and seaplanes upon the approval of the Procuring Agency (Navy Bureau of Aeronautics, Washington, D. C.). Zinc coatings in this application shall not be less than .001" thick.

(b) Contractors are cautioned against wastage of cadmium through overplating. Requests for allocation of cadmium will be reviewed to insure that only the minimum quantity of cadmium necessary to maintain production of essential items is being requested. Continued use of cadmium in applications where zinc has been approved will not be tolerated after it has been determined that substitution is practicable from production and engineering standpoints.

(c) Contractors shall inform the Services (Army Air Forces, Materiel Command, Wright Field, Dayton, Ohio; Navy Bureau of Aeronautics, Washington, D. C.) upon determination of additional conversions from cadmium in order that they may be made generally mandatory, after receiving Service approval.

5. *Other Considerations—Cadmium and Zinc Plating*

(a) To assist contractors in making conversion from cadmium to zinc, Conservation Bulletin No. 6A has been issued by the Committee and should be consulted in connection with the provisions of this directive.

(b) Zinc shall not be used where corrosion products might interfere with normal functioning. For this reason, magneto and carburetor parts are permitted to be cadmium plated as noted in paragraph 2(a). However, the formation of white corrosion products will be prevented or significantly retarded through suitable treatment such as specified in the latest revision of specification AN-P-32.

(c) Caution should be used in parts made of high or medium carbon steel

as plating in certain types of zinc cyanide baths is reported to result in hydrogen embrittlement. Acid plating, and possibly certain proprietary baths, may not be objectionable in this respect.

6. *Use of Protective Coatings Other Than Zinc Electroplate*

Sprayed and hot dipped zinc coatings and lead may be suitable in many applications and their use should be investigated. Consideration should be given to the use of phosphating treatments, followed by appropriate primer and paint schedules. However, the use of coatings other than zinc electroplate must be specifically approved for the intended application by the Procuring Agency (Army Air Force, Materiel Command, Wright Field, Dayton, Ohio; Navy Bureau of Aeronautics, Washington, D. C.).

7. *Revised Army-Navy Aeronautical Specifications*

Specifications have been revised to reduce minimum plating thickness to 0.0003″ cadmium and 0.0005″ zinc in general applications, and 0.0002″ cadmium or zinc where external threads form a major portion of the article or where close dimensional tolerances will not permit greater thicknesses. In addition, a plating thickness of 0.0002″ is acceptable on steel washers, nuts, bolts, screws and studs and will be allowed for other similar items of aircraft hardware where the specified thickness requirement may cause serious production delay. Strict adherence to specification requirements as outlined above should result in substantial savings of cadmium. No minimum is provided for holes, recesses, internal threads and other areas where thicknesses are subject to incomplete control under normal plating conditions. The salt spray test is no longer required on such parts when zinc plated with thicknesses of less than 0.0005″.

8. *General*

It is incumbent upon the contractor to comply with this directive by initiating action in accordance with the contractual provisions governing changes and costs at the earliest practicable date.

Where compliance with this directive will interfere with production or where the substitutions required herein will in the opinion of the contractor adversely affect performance or reliability the contractor shall bring such items to the attention of the Services.

9. *Changes Introduced in this Revision*

Through this revision, continued use of cadmium plating for aircraft bolts, nuts, screws, and washers, other than self-locking nuts limited by design to applications under 250° F. is permitted in Paragraph 2(a)(1). Other changes are for purposes of emphasis and clarification.

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INDUSTRY NEWS

Editor
Monthly Review
Am. Electroplaters Society
545 Fifth Avenue
New York, N. Y.

October 12, 1943

Sir:-

We read with interest Mr. Calabrese's article on Brass Plating in the Sept. 1943 issue.

One point in this paper however, puzzles us. In the author's method for Zinc on Page 814 he suggests the addition of 1 c.c. of Uranium Nitrate (concentration unstated) to the zinc solution prior to titrating. Since the uranium salt reacts with ferrocyanides and is used in detecting the end point (excess of ferrocyanide) it would appear that any preliminary addition of this reagent would produce an error to the extent of the addition.

We would appreciate knowing whether some unusual factor makes this addition of uranium nitrate necessary.

Very truly yours,
Benjamin S. Flug
Raymond Karczynski

E. T. Candee
Box 791
Waterbury, Conn.

November 2, 1943

Dear Mr. Candee:

I wish to thank Mr. Flug and Mr. Karczynski for their interest in my article on Brass Plating and will gladly explain my reason for the use of Uranium Nitrate in Zinc solution prior to titrating.

Stock solution of Uranium Nitrate is made up (1 gr. Uranium Nitrate 100 c.c. Water); 1 c.c. of stock solution is added to zinc solution.

The addition of Uranium Nitrate in no way interferes with the zinc content of a Brass solution.

Tests have been made on a number of occasions from the same solution without the addition of Uranium Nitrate and the calculations have been the same.

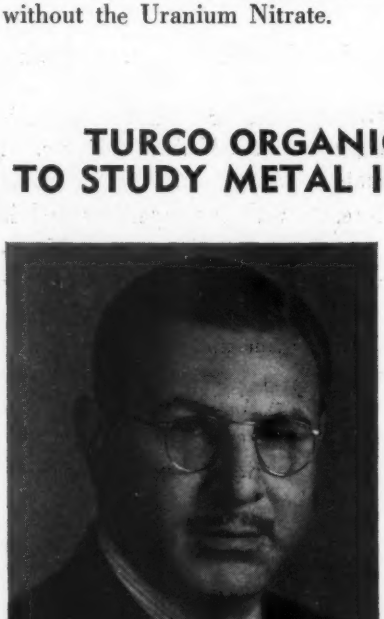
The reason for the addition of Uranium Nitrate has been in my experience a guide on the approaching end point of the titration. A cloudy greenish tint appears just before the end point is reached.

Without the 1 c.c. Uranium Nitrate in zinc solution when you titrate with n/10 solution of ferro-cyanide solution is a cloudy blue and that color remains in that state until the end point is completed.

The possibility of going over end point is much more dangerous without the Uranium Nitrate.

Very truly yours,
D. A. CALABRESE

TURCO ORGANIC RESEARCH LAB TO STUDY METAL INDUSTRY PROBLEMS



To keep pace with new problems in the metal industries, an organic research laboratory has been opened in the Turco Los Angeles laboratory, according to S. G. Thornbury, president of Turco Products, Inc. Dr. Nathaniel Baum has been appointed head of the new department.

Doctor Baum came to Los Angeles from Chicago where he had been consulting chemist in organic synthesis and resins for the last six years. He received his doctor's degree in chemistry at Columbia University in 1930.

Turco manufactures more than 225 specialized industrial chemical compounds, many of which are used in the metal industries.

GALVANIZERS NEEDED

The Portsmouth Navy Yard is urgently in need of skilled galvanizers.

Pay scale is $7.25 per day with time and a half for Saturday.

Men who can qualify are urged to communicate with Mr. LESLIE E. GUILFORD, Special Representative, Labor Board, Portsmouth Navy Yard, Boston, Mass.

H. S. TWEEDY APPOINTED DETREX SERVICE MANAGER

W. W. Davidson, Vice President of Detrex Corporation, Detroit 27, Michigan, metal cleaning engineers, announces the appointment of Harry S. Tweedy as manager, Field Service Division.

Mr. Tweedy has been chief inspector of production in all Detrex plants since December, 1940. Prior to that time he served for four years as a design engineer.

Until recently, Mr. Tweedy has also been a member of the faculty of the University of Detroit and is a registered engineer. He taught engineering technique and mathematics in the university night school. His practical experience and educating ability will be most useful in the enlarged field program being placed into operation by Detrex.

Born in Ireland, Mr. Tweedy was educated at Dublin University whee he received his B.A., B.S.C. and B. Eng. degrees. During World War I, he was a Captain in the 3rd Royal Dublin Fusiliers and served with the British Expeditionary Forces from 1915-1919.

PENN SALT INCREASES STAFF

Dr. S. C. Ogburn, Jr., Manager of the Research and Development Department, Pennsylvania Salt Manufacturing Company, Philadelphia, announces the following recent additions to the Company's Research and Development Department Staff:

Mr. J. Grant-Mackay, formerly with Jefferson Island Salt Mining Company; Mr. Francis E. Murphy, formerly with General Chemical Company; Dr. Herbert E. Ricks, formerly with Gutham Radio Company; Mr. W. C. Wolfe, formerly with Petroleum Chemicals, Inc.; and Mr. Alfred H. Pope, formerly with General Chemical Defense Corporation.

In addition to the above, Dr. Ogburn states that a number of recent college graduates have been added to his Staff including:

Mr. William K. Conn, Haverford College; Mr. James H. Koob, LaSalle College; Mr. Lester S. Verdelli, Ursinus College; Miss Anne M. Buchy, Chestnut Hill College; and Miss Evelyn C. Sisson, Indiana University.

PENN SALT ACQUIRES STOTESBURY HOUSE

The famous Stotesbury Estate WHITEMARSH HALL, has been acquired by Penn Salt and will be converted into a research laboratory. Plans call for a staff of 75 chemists and their assistants to carry on scientific studies for use in various Penn Salt Plants.

The Research Department is in charge of Dr. S. C. Ogburn, Jr., which is divided into 3 principal divisions, Research under Dr. R. L. Brown, Development under W. S. Riggs, Patents under H. E. Gibbs.

WILLIAM HARRISON DIES

The secretary of Newark Branch announces with deep regret the passing of WILLIAM HARRISON, a staunch member of that Branch. His many friends will miss him.

STEVENS OFFERS NEW CATALOG

Frederic B. Stevens, Inc., Detroit, has just issued a new 40 page catalog.

Interesting, informative and well illustrated, the catalog describes the Stevens Full Automatic and Semi-Automatic plating, cleaning, and pickling, bright dipping and special processing machines.

New developments and improvements are described in the readable pages.

The first page points out Stevens has enjoyed over half a century of continuous progress.

Catalog may be obtained by writing STEVENS direct.

SALES SERVICE MEN WANTED

Wanted by old established company—Technical Sales Service Men for servicing metal cleaning and wire drawing chemicals to war plants in the metal processing industries, chemical or technical background helpful. Good salary while training with drawing account and liberal commission plan when assigned a territory. Excellent postwar prospects. Address Box No. M.R. 12, care Monthly Review.

SPEAKERS AVAILABLE

The National office of A. E. S. has been informed that the following speakers are available for Branches located in the East and Mid-West, expenses to be paid by the Speaker.

ELECTRONIC TANK CONTROLLERS
BY FREDRIC W. HAMPSON

EFFECTS OF CURRENT DISTRIBUTION
IN ELECTRO DEPOSITION
BY FREDRIC W. HAMPSON

SALVAGE
BY HAROLD NARCUS

NEWBERY APPOINTED SALES MANAGER DETREX CORPORATION

W. F. Newbery has been appointed Sales Manager of the Industrial Division of Detrex Corporation, Detroit, Michigan, according to an announcement by W. W. Davidson, Vice President. Detrex Corporation, formerly known as Detroit Rex Products Company, manufactures a complete line of metal cleaning equipment and materials.

Mr. Newbery started with Detrex in 1934 as sales and service engineer in the northeastern states, later serving as Eastern Region Manager for several years. More recently he was South Central Region Manager with headquarters at Dayton, Ohio.

He brings to the main office in Detroit wide field experience in cleaning problems and applications, especially in the aircraft industry where fast, thorough cleaning is essential to war winning-production.

WRAP-RAX

for

INSULATING PLATING RACKS

and as a

STOP-OFF

Applying Wrap-Rax to a Plating Rack

Wrap-Rax finds wide use as a Stop-Off

Wrap-Rax, a specially developed synthetic resin in tape form, is not only an ideal insulator for plating racks, but it is taking a commanding place as a stop-off in hard chromium and other plating solutions.

Wrap-Rax has these desirable characteristics:

- **Is easy and quick to apply.**
- **Gives full protection with one simple application.**
- **Has extreme durability—**
  Resists all commercial cleaning, pickling and plating solutions. Withstands rough handling and remains flexible.
- **Provides uniform coverage, on edges and flat surfaces.**
- **Is clean and safe to handle.**

Wrap-Rax is available for prompt shipment. It is furnished in rolls of ¾-inch tape approximately 250 feet long.

HANSON-VAN WINKLE-MUNNING CO. · MATAWAN, NEW JERSEY U.S.A. · SINCE 1820

Manufacturers of a complete line of electroplating and polishing equipment and supplies

HANSON-VAN WINKLE-MUNNING CO.

MATAWAN, NEW JERSEY

PLANTS: . . . Matawan, New Jersey • • Anderson, Indiana • • Bridgeport, Connecticut

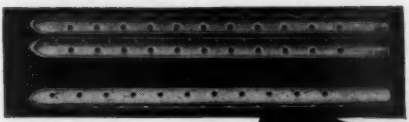
SALES OFFICES: . . . Anderson • Bridgeport • Chicago • Cleveland • Dayton • Detroit • Elkhart • Matawan Milwaukee • New Haven • New York • Philadelphia • Pittsburgh • Springfield (Mass.) • Syracuse

S-B PROCESS
FOR VERSATILITY IN ZINC PLATING

The Hanson-Van Winkle-Munning S-B Zinc Plating Process is unsurpassed for versatility. Its operating range is unusually wide.

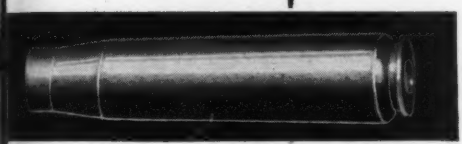
This high speed, alkaline, all-purpose solution produces pure semi-bright to bright electrolytic zinc deposits which are highly protective.

HERE IS EVIDENCE
of S-B Process versatility



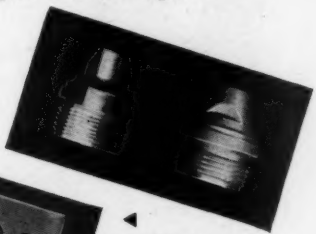
▲ **THROWING POWER** . . . Without the use of an auxiliary anode, this 10-inch primer tube receives a deposit .0003 inches on the outside and .0001 inches inside.

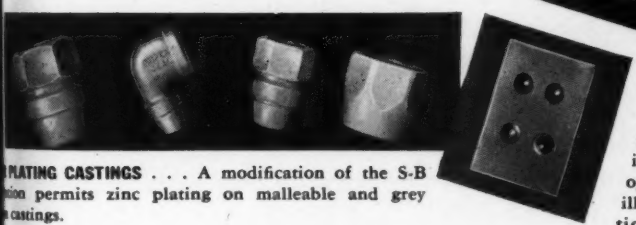
BRIGHTNESS . . . a wide range of operating characteristics makes possible bright lustrous deposits suitable for future consumer goods. The clear, uniform surface obtained aids in the inspection of war materiel. ▶



◀ **ADAPTABILITY** . . . This 20-mm. steel shell case has been given a chromate film over the S-B zinc deposit. Phosphate and other chemical films are commonly applied subsequent to the zinc deposit.

ARMY AND NAVY SPECIFICATIONS . . . S-B Process electrolytic zinc deposits meets all Army and Navy specifications. ▶





PLATING CASTINGS . . . A modification of the S-B ion permits zinc plating on malleable and grey castings.

◀ **DUCTILITY**
S-B Process zinc plated steel will withstand drawing, bending and forming operations. Cupping tests illustrated show deformation to point of rupture without peeling.

Are you considering a new zinc plating installation — a conversion from cadmium to zinc? Our nearest representative will be glad to give you full details on the S-B Process for all-purpose zinc plating.

Manufacturers of a complete line of electroplating and polishing equipment and supplies

HANSON-VAN WINKLE-MUNNING CO.

MATAWAN, NEW JERSEY

PLANTS: . . . Matawan, New Jersey • • Anderson, Indiana • • Bridgeport, Connecticut

SALES OFFICES: . . Anderson • Bridgeport • Chicago • Cleveland • Dayton • Detroit • Elkhart • Matawan Milwaukee • New Haven • New York • Philadelphia • Pittsburgh • Springfield (Mass.) • Syracuse

4831

NEW Equipment Materials Supplies

NEW DIAMOND BONDED WHEEL

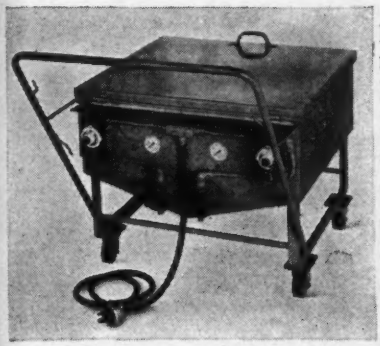
A newcomer in the field of diamond bonded wheels is the new Super-Cut just announced by Industrial Abrasives, Inc., 3724 West 38th St., Chicago 32, Illinois. A new secret bonding process gives to Super-Cut Diamond Wheels an unusually long life, as proven by numerous tests across country, according to W. B. Muse, Sales Manager. "The new bonding process sets each individual diamond solidly in a special metal, and also uniformly, thus giving both fast cutting and long life," said Muse, following a cross country inspection trip of three weeks during which time the operation of the new diamond wheel was observed and tabulated in hundreds of war plants and machine shops.

Super-Cut Diamond Bonded Wheels are made in a wide variety of types and sizes, and are thus adaptable, according to Muse, to hundreds of tool and grinding operations.

"The new Super-Cut Diamond Wheel is especially adapted to the new program of tool conservation and *superfine* finishing now employed in up-to-date plants," said Muse. "It is my opinion that this entire program will save more than a million man hours per day in the war industries of the Nation."

Catalog and price list now available. Immediate shipments.

PORTABLE ELECTRICALLY HEATED COMBINATION METAL CLEANING AND RINSING TANK



Two hot liquid dip tanks in one portable unit feature the Twin Dipmaster developed by the Aeroil Burner Company, West New York, N. J., thus enabling the operator to clean and rinse metal parts and products without the necessity of carrying them to a second tank for hot or cold rinsing, it is claimed by this manufacturer. Plugs in on 110 or 220 volts A.C. or D.C. for instant heating. Equipped with two insulated compartments separated by a partition that is also insulated, the Twin Dipmaster has two removable immersion tube heating units (one for each tank) that deliver all the heat in the cleaning solution and rinse water. Separate, automatic heat control for each compartment is supplied by two thermostats regulating any required temperature from 110-550° F. and they operate independently of one another. In addition there are two built-in thermometers registering temperatures from 100-600° F. and four dipping baskets.

Completing the standard equipment are scum gutters, draw-off cocks, an insulated cover, pipe connections for the addition of fresh water to the rinse compartment as well as to drain off contaminated liquids and two work grilles on which bulky parts can be rested during the cleaning and rinsing processes.

THE ALRONOX PROCESS

This process produces the even black, corrosion resistant finish on zinc or zinc alloy surfaces, necessary for most war-time products of this type.

Developed and manufactured by The Alrose Chemical Co. of Providence, R. I., Alronox is easily and economically applied by immersion.

No elaborate equipment or controls are necessary for application and the process is adaptable to all zinc and die cast surfaces and can

be applied within a 7 minute cycle. Furthermore, this process is non-electrolytic and has a salt spray rating of 200-300 hrs. on .0002 zinc plate over steel, without after coating.

It is considered an excellent base for organic coatings and has high weather and humidity resistance. Also, it will not chip or peel and offers minimum reflectivity.

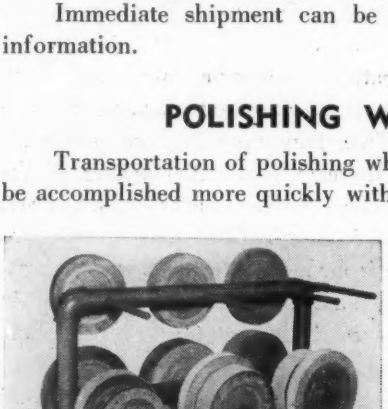
SPEARE'S SAFETY SIPHON

M. E. Baker Co., Cambridge, Mass., are distributors of this new product. Speare's Siphon is an all plastic device for safe handling of most industrial acids; self-priming, with valve control to regulate flow.

Immediate shipment can be made. Write direct for complete information.

POLISHING WHEEL TRUCKS

Transportation of polishing wheels becomes an easier task and can be accomplished more quickly with this Model 41D heavy duty Divine polishing wheel truck for handling larger wheels. Its easy-swivelling design and roller bearing Divine centers make heavy leads easy to move. Its steel-armored platform edges assure long life. It has six spindles per side, each 1" in diameter and 14" long and has handles at the end of the frame for pushing or pulling. Size: 2' 6" wide x 5' long x 43" high.



For further information write Divine Bros., Utica, N. Y.

OAKITE DE-SCALING MANUAL

When faced with the problem of removing rust and scale from water-cooled and water-circulating equipment, wartime maintenance executives are concerned with three major aims: (1) to increase output of existing equipment; (2) to shorten down-time; and (3) to conserve time and manpower. Of particular interest, in this connection, is a

newly-revised and enlarged sixth edition of the 28-page Oakite De-Scaling Manual.

The manual contains 28 pages of practical data that has been collated, in a concise, easy-to-read fashion, to help works managers, plant superintendents, mechanical engineers and other maintenance executives increase output of existing equipment, shorten shut-down time and conserve manpower in cleaning and de-scaling varied types of equipment common in the metal working industry. Among them are blast furnace cooling coils, metal washing machines, lead oxide mixers, welding machines, cutting and quenching oil cooling coils, water-cooled brazing and annealing furnaces as well as gasoline and Diesel engine cooling systems, lube oil and jacket water coolers, refrigerant condensers and compressors, surface condensers, feedwater heaters and other heat exchangers.

Data is also given on an acid-type, scale-dissolving material known as Oakite Compound No. 32 which eliminates the hazards to personnel and equipment so frequently involved in the use of commercial raw acids for these de-scaling operations. The manual also explains how this material eliminates the need of tedious, time-consuming mechanical methods on a wide range of scale and rust removal work.

Of special interest to production executives is the information presented in the manual on how Oakite Compound No. 32 is being widely used to remove mill scale and other scale deposits from heat treated, hardened, annealed or welded war supply items before subsequent finishing operations and to rid parts of rust between manufacturing or assembly operations. Copies of this specially prepared, illustrated manual are freely available on request. Write to Oakite Products, Inc., 40 Thames Street, New York 6, N. Y.

SPECIAL ABRASIVE POWDERS

The E. E. Seeley Co., Bridgeport, Conn., have developed special abrasive powders for tumble barreling of either steel parts or aluminum, known under the trade name of "Kwikbur." Working samples freely furnished upon request.

SERIES NEW FOLDERS

E. Reed Burns Mfg. Co., Brooklyn, N. Y. announce for distribution a series of new folders. STEELSHINE, describes a rouge particularly adopted for use on all steels, especially stainless. EMERITE, describes an Emery Paste to be used with Green Thread Brand Polishing Wheels or Buffs.

ALUMINITE PASTE, describes a paste to replace EMERY PASTES for polishing all stainless metals. Designed expressly for this work since they contain no oxide, always present in emery.

BURNS BURRING COMPOUND, describes a compound well suited for removal of burrs, sharp corners, tool marks and surface imperfections on ferrous and non-ferrous stampings, castings, and forgings. Write direct to manufacturer for folders and complete information.

● ● ●

GRAND RAPIDS ANNUAL MEETING

The Grand Rapids Branch wishes to advise their Annual Educational Session and Dinner Dance will be held January 15, 1944 at the Pantlind Hotel.

The Educational Session starts at 2:00 P.M. The Session Chairman will be Cleve Nixon of the Ternsdedt Mfg. Company, Detroit, Michigan.

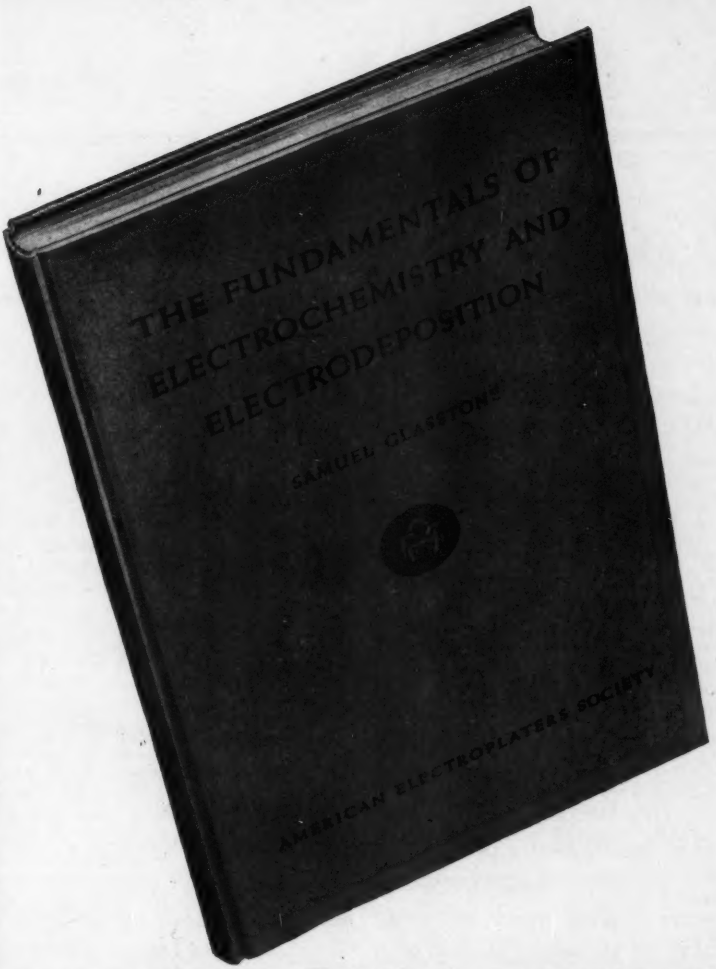
The three speakers and their subjects are as follows:

1. "Addition Agents in Electroplating" by Dr .F. C. Mathers, Dept. of Chemistry, Indiana University, Bloomington, Indiana.

2. "New Uses of Cation and of Anion Exchange Medium in the Plating Industry" by W. S. Morrison, Illinois Water Treatment Company, Rockford, Illinois.

3. "Electrogalvonizing of Strip Steel" by Ernest H. Lyons, Jr., The Meaker Company, Chicago, Illinois.

J. M. HAVILAND,
Chairman Publicity Committee



INDISPENSABLE TO *Practical* ELECTROPLATERS

A.E.S. announces publication of "The Fundamentals of Electrochemistry and Electrodeposition" . . . by Samuel Glasstone!

With this announcement, A.E.S. initiates another new, needed, vitally important service. This—and similar manuals to follow—condense into compact, practical handbook form—the authentic essentials of the science of electroplating. Dr. Glasstone's book is a compilation of the much-discussed series of articles which appeared, during the past year in the *Monthly Review*. But the material has been completely revised in the light of latest war-time developments . . . to provide practical, daily usefulness to schools, colleges, and every serious electroplater!

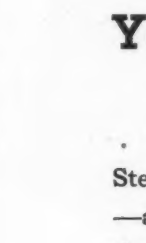
Handsomely printed, richly case-bound, over 100 pages 5¼x8¼ and priced at only $2.00 per copy, as an educational feature of A.E.S.

Send check or money order to National Headquarters.

AMERICAN ELECTROPLATERS SOCIETY
545 Fifth Avenue, New York, N. Y.

Your Scrap Pile Is a National Asset

Steel mills continue to need scrap metal —all they can get. For the same reason that scrap is valuable it is important to avoid unnecessary scrapping of equipment. First step in making things last is to postpone need for repair and replacement by making them durable enough in the first place, using the best quality of materials available, and specifying the best of weldmanship in fabrication.



STORTS WELDING COMPANY

42 Stone Street Meriden, Conn.

Manufacturers of Welded Fabrications to Specification

BRANCH NEWS

Business and Social News • Educational Activities

PROVIDENCE-ATTLEBORO BRANCH

The regular monthly session of the Branch was held Monday evening, November 15th as scheduled in the French Room of the Crown Hotel in Providence.

The meeting was preceded by the usual dinner at 6:30 which many of the members and guest speaker attended.

The speaker of the evening, Mr. Henry Mahlstedt of United Chromium Inc. was introduced by the Branch President, J. T. Henry, Jr. at 8:30 o'clock.

Mr. Mahlstedt's talk on "Industrial Chromium Plating" was delightfully presented, and in a manner greatly appreciated by his hearers. He very tactfully and with perfect grace confined himself to the points of most interest and helpfulness to the fellow who really has to supervise or whose job it is to accomplish the work of Chrome plating as demanded today by modern industry.

The question period following the talk lasted until well into the night, and finally the speaker was extended a vote of thanks for his painstaking effort and excellent judgment in bringing to them in so direct a manner, only the particular points of the business that was of the most importance and benefit to his audience.

All Branch officers and about thirty-five electroplaters were present at this meeting, and after his usual well chosen remarks dealing with the welfare of the Branch, the President, Mr. Henry, closed the meeting at 11:15 o'clock.

CHAS. C. CHACE, *Secretary*

NEWARK BRANCH

The regular meeting of the Newark Branch, A. E. S. was held on Friday, November 5th, 1943 at the Hotel Robert Treat, Newark, New Jersey. The meeting was called to order at 8:45 P.M. by President William Bruhns. In the absence of Mr. George Wagner, who was in attendance at a Regional Meeting of the A. E. S. in Dayton, in his capacity of Supreme President, Mr. John DeVries acted as secretary.

Due to Mr. Wagner's absence, the minutes of the previous meeting were omitted. Mr. Horace Smith reported that plans for our annual Christmas party were well under way. Mr. Edward Washburn announced that the Year Book would very shortly be ready for publication.

Mr. Horace Smith expressed his appreciation and told something of his personal feelings regarding the Testimonial Banquet tendered him and George Wagner on the 23rd of October. He also read the official invitation for the benefit of the members and stated that he intended to keep it framed as one of his most valued and cherished possessions.

At this point the meeting was turned over to our Librarian, Mr. Edward Washburn, who introduced as the speaker of the evening, Mr. Victor Bradford, of Walter Kidde & Company, who gave us a very interesting talk on the metallurgical aspect of heat treating and in particular its relation to subsequent metal finishing. Mr. Bradford covered something of the various types of furnaces used, the general types of oxides that can form, their relative difficulties of removal and told us a little of the advantages of the new development of induction heat treating. He constantly held before us the fact that the steel mills in the intermediate operations in the production of steels do

everything possible to prevent or remove any stresses or strains in order that future operations may be better performed and urged this same type of cooperation between heat treating and subsequent plating or finishing departments. The balance of the time was devoted to questions and discussion from which some very interesting information was produced.

The meeting was adjourned at 10:35 P.M.

J. L. DEVRIES, *Secretary, Pro Tem.*

GRAND RAPIDS BRANCH

Grand Rapids Branch held their regular meeting November 12th at the Rowe Hotel.

The meeting was started promptly at eight o'clock by the showing of moving pictures, one of which was the latest convention film of the Buffalo Convention held last June.

The business was conducted by President Homer Morton. Reports of all Committees were given. Those Chairman members working on the Annual Educational Session and Dinner Dance to be held January 15th reported a very satisfactory progress being made for this coming event. Speakers have all been engaged and reservations and ticket sales are being received promptly.

Two new members were elected: Mr. Lewis Parker and Albert J. Nook of Kalamazoo, Michigan. Also, two applications were presented to be elected during the December meeting.

Our speaker for the evening was Mr. W. L. Hensley, Technical Director of Zapon Division of Atlas Powder Co., and was then introduced, and gave us a long extensive talk on the "Possibilities of Synthetic Enamels." He described the advantages of synthetics very thoroughly making specific applications to war products.

Refreshments were served by the Hotel at the close of the meeting.

C. E. ABEL, *Sec'y-Treas.*

WATERBURY BRANCH

Waterbury Branch held its regular monthly meeting November 12, 1943. As usual the technical session was preceded by dinner at 6:30 in the Colonial Room in the Hotel Elton.

At 8 o'clock President Carl Kilborn opened the meeting by first announcing that in order to further the interest in the meetings and to keep better contact with our members and friends, three committees had been formed: a Reception Committee under the Chairmanship of Bert Sage, a Program Committee headed by A. W. Tracy, and a Sick Committee headed by W. J. Gray.

Attention was called to the Hartford meeting to be held November 15, which should be of particular interest to our members.

W. L. Cassell, when called upon, reported that our membership drive was lagging. It has been our policy not to use high pressure in obtaining members. We have considered it desirable to accept applications only from members who are genuinely interested and who will continue their interest. This does not mean, however, that we should rest in our efforts to obtain new members as there are undoubtedly many who would be very glad to have the opportunity of joining the Branch if someone acquainted them with the work.

There being no further announcements, the meeting was turned over to our Technical Chairman, Maurice Henry, who proceeded with the educational program. This opened with the monthly book review by Dr. George Dubpernell. George's choice of a book for the evening was "The Journal of the Electrodepositors' Technical Society," Vol. 17 for 1941 and 1942. This is the last volume published by this society whose activities have been severely limited by the war and is perhaps not quite as large as those preceding it. It does contain a number of papers of great interest to electroplaters' and our members will find it well worth reading.

Bill Starr in his monthly talk on priorities discussed the recent government order allocating Sodium Cyanide. When once operating this order should cause no great inconvenience to platers if they will take the trouble to anticipate their requirements well in advance.

The moving picture of the evening was a sound film "Electronics at Work" presented by the Westinghouse Electric and Manufacturing Co. Mr. Thomas

Russell of the Bridgeport Branch of Westinghouse briefly reviewed the subject, and then presented the film which showed the enormous possibilities of electronic controls in industry and in our every day life. Of great interest to electroplaters' is the post-war replacement of motor generator sets and rectifiers by electronic tubes for converting A. C. to low voltage D. C. current.

Mr. W. H. Lutz, Technical Director of Pratt and Lambert, Inc., was the speaker of the evening. His subject was "Production Painting." He outlined the difficulty in obtaining many of the materials which go into the formulation of paint materials. Large quantities of Linseed Oil in particular are being sent to Russia for food. Other oils are unobtainable because of the lack of imports, while other supplies are now in the hands of Japan. However, much work has been done on the oils we have available, and these have been changed to give properties which in some instances are superior to the natural oil. He continued showing the properties and uses of the various pigments and resins entering into these materials, and finished his talk by covering the methods used for applying paint and lacquers. It was an excellent presentation of the subject and was well received by all those present. An extended question period resulted and Mr. Lutz was accorded a rising vote of thanks at the conclusion.

President Carl Kilborn, in closing the meeting, announced that the Branch would hold a business meeting at the home of W. L. Cassell in Watertown, on November 19, 1943.

S. L. HENN, *Secretary*

LOS ANGELES BRANCH

The regular meeting of the Los Angeles Branch was held Nov. 8, 1943 at the Rosslyn Hotel.

First Vice President, Joseph Sunderhouse, in the absence of President E. R. Holman, called the meeting to order.

Stanley Rynkofs, Sergeant at Arms, introduced the following visitors, C. P. Graham and H. Woodward of Hard

SAVE *time and money*—

DEBURRING & BURNISHING METAL PARTS

Today's production requirements call for speed and efficiency. Rounding corners or removing burrs by old time filing or grinding methods is costly.

Do the job speedily. There are many jobs that lend themselves to barrel finishing. Write us today for complete information.

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Attleboro, Mass.
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MR. H. GREEN **Telephone MU. 6-8393**

Chrome Eng. Co.; E. Anderson, Mr. Gurman and Mr. J. Hufft of Mission Plating Co.

The meeting was turned over to Mr. Earl Coffin, librarian, who introduced Mr. Ingrams of the W.P.B. Priorities Board. Mr. Ingrams explained very clearly how to get metal and equipment. He also clarified several points on different forms to fill out. The talk was very interesting as well as educational.

Mr. Coffin gave an abstract of Mr. Fletcher's paper on applying hard chrome to tools which was given at the National Convention. This started some interesting discussions.

Meeting was turned over to acting president, who called a five minute recess and dismissed the visitors.

Business meeting was called to order. Mr. Leo Brame was initiated as an active member. Minutes and financial reports were read and approved. Bills ordered paid. Under old business, Mr. Lamoureux, chairman of the Board of Managers gave a report on delinquent members and a motion was made and carried that the following members be suspended: M. H. Biderman, W. C. Brokus, H. C. Caricker, E. O. Foster, R. Hinkel, H. H. Morrell, R. Munoz, F. W. Shaw, Sr., V. Stabile, R. R. Wilde.

New Business. Marcus Rynkofs was appointed chairman of committee to investigate the possibilities of having the Annual Dinner Dance this year.

Meeting adjourned, 10:45.

C. C. MCLAREN, *Secretary*

ROCHESTER BRANCH

The Rochester Branch of the American Electroplaters' Society held the regular monthly meeting Wednesday. November 10, 1943, at the Rochester Chamber of Commerce. Meeting was called to order at 8:30 by President John Q. Adams.

The minutes of the previous meeting were read and approved and the financial report was read to date.

Under new business, it was decided that the Board of Managers would meet Wednesday, November 17, to make further plans to enlarge and improve the Branch and also, to talk over plans for a Spring Banquet and Educational Session.

Our Educational Chairman Mr. Tucker, then introduced Mr. Helbig, speaker for the evening. Mr. Helbig is assistant engineer of the Darco Corporation, New York; and has a B. S. degree and a Chemical Engineer degree from the College of New York; and has worked for the Darco Corp. since 1928. He has worked primarily on industrial applications of activated carbon in the chemical industry, alcoholic beverage; water purification fields and more recently on sulfa drugs and penicillin.

Mr. Helbig gave one of the most interesting and helpful talks on the problems of filtration Our Branch has yet experienced. Reprints of his papers published in the *Metal Industry* and *The Monthly Review*, were distributed to the members. These reprints will prove very valuable in remembering his splendid demonstration.

Members of the Rochester Branch extend sincere thanks for the courtesy shown to the Branch by Stromberg Carlson, Eastman Kodak Co., and Bausch and Lomb Optical Co. for providing the necessary equipment for the complete filter set up, on which, Mr. Helbig gave his most interesting demonstration.

We all wish to thank Mr. Helbig again as we appreciate very much his time and efforts spent.

The meeting was adjourned at 10:30.

DONALD C. BLUM, *Secretary*

CHICAGO BRANCH

The regular monthly meeting of Chicago Branch was held Friday, Nov. 12, 1943, at the Atlantic Hotel.

President R. J. Hazucha presiding and all other Officers present.

I am very sorry to report the death of Mr. G. A. Spencer who was President of the Crown Rheostat & Supply Co. and a very loyal member of Chicago Branch; Chicago Branch Officers and members extend their deepest sympathy to Mrs. Spencer and daughter.

Mr. J. Barron of Boston Branch was a guest at this meeting and his many friends were pleased to see him. There were 15 new members elected at this meeting.

Mr. Smallman, chairman of the banquet committee reported that all plans were now complete for our 32nd An-

nual Educational session and Banquet to be held the 22nd of Jan. 1944 at the Palmer House.

Mr. Krentel, our librarian, introduced the speaker of the evening, one of our very loyal and capable members, Mr. E. J. Lyons, Jr., of the Meaker Co., who gave a very interesting and instructive talk on "Strip Electro Galvanizing."

The following questions were found in the question box:

Is there any publication of a paper on the purification of Copper & Brass plating solutions?

Ans. Yes. In our Monthly Review in 1939 by Mr. V. Mattacotti.

Can steel anodes be used in a zinc solution to help control the metal content?

Ans. Yes. In the proper ratio with zinc anodes.

What roll contact area is required per thousand amps. on the "Strip Electro Galvanizing method"?

Ans. Depends on the speed of the machine.

What is the best quick method for testing thickness on Nickel deposit on Brass?

Ans. The Magnia Gauge.

There were 55 in attendance at this meeting which adjourned at 10:15 P.M.

J. W. HANLON, *Secretary*

PHILADELPHIA BRANCH

President Verrell called one of the largest (about 60) Philadelphia Branch meetings to order at the Harrison Laboratory of the U. of P. on the 5th Friday of October.

Librarian Orlik, at the request of the President, introduced the speaker of the evening, Robert R. Sizelove, of Newark Branch; whose subjects were Tumble Deburring and Electroplating with Dual Current.

Mr. Sizelove gave a short history of Barrel Burnishing and Sanding as practiced in the past; and, then discussed one of the present methods called Tumble Deburring. Samples, of which, both before and after tumbling, were shown; the finished ones processed thru the use of special compounds produced by the Frederick Gumm Chemical Co. There were many comments and discussions.

The speaker followed with an actual demonstration of the Dual Current Electroplating; stressing the need for special additions to the solutions, also special electrical equipment for superimposing A.C. current on the regular D.C. The result being heavier deposits in a shorter time, which seems to be needed at this particular time. The members went right after him with many questions; which, in most cases, were answered.

Librarian Orlik called for a rising vote of thanks.

The minutes of the previous meeting were approved as read.

The applications of Peter A. Vadurro, active, and associates, Charles H. Burris, Jr., Edward J. Hein, Persifer B. Kennedy, and Edward V. Tapp, were referred to the Board of Managers.

W. H. Hogg and H. F. McIntyre, associates, were elected after approval by the Board of Managers.

Motion—the bills be paid. Carried.

Adjournment at 10:45 P.M.

PAUL MENTZER, *Secretary*

Philadelphia Branch, thru the efforts of the Entertainment Committee, Nat Verrell, chairman had a very successful dinner meeting at the Broadwood Hotel on their regular 4th Friday of the month with 47 members at the festive board.

Librarian Orlik said unavoidable circumstances prevented Bob Sizelove of the Newark Branch from fulfilling the duties of speaker.

2nd Vice-President E. J. Zurbach, Jr., pinch hitted with a zinc discussion, which turned into quite a question and answer session for well over an hour and a half.

Mr. Zurbach received a rising vote of thanks.

Reading of the minutes of the previous meeting deferred to a later date.

An invitation to attend the Fall Electrochemical Society Sessions was read and noted.

Motion—Yearly Meetings be discontinued for the duration. Carried.

Motion—Social Nite in November to be at the discretion of the Entertainment Committee. Carried.

The Branch paused to note the passing of Frank L. Antisell, associate, a member for 13 years. A card of belated sympathy was mailed to his widow.

The applications of Horace F. McIntyre, and Wilfred H. Hogg, associates, were referred to the Board of Managers.

The bills were ordered paid. Adjourned at 11:00 P.M.

PAUL MENTZER, *Secretary*

HARTFORD BRANCH

The regular monthly meeting of the Hartford Branch was held Monday, October 18 at the Club House of the Stanley Golf Course in New Britain, Conn. The speaker of the evening together with twenty members enjoyed a tasty chicken dinner prior to the meeting. I should like to mention here that our charming new members Miss Doris Lowe and Miss Marjorie Farmer were also present.

The meeting was called to order at 8:00 P. M., by President Ken Bellinger with 36 members present.

The following applicants were elected to membership: John T. Wieczorek, William J. Scott, Walter J. Dyber, Carmen N. Cappello, Ray H. Hathaway, Andrew W. Palm, Marjorie E. Farmer and Louis F. Galasso. Applications accepted were: H. R. Pellington and Angelo Jannetta. Transfers accepted were Ovide G. Hogaboom from the New Haven Branch.

The speaker of the evening was Mr. Thomas Page McFarlane whose subject was Nickel Plating.

Mr. McFarlane who is presently associated with the American Hardware Corp. of New Britain, Connecticut, has had a wide experience and background for this subject including considerable work with Dr. Wesley of the International Nickel Co. Preceeding the paper on Nickel Plating, Mr. McFarlane gave us a brief, concise summation of the electrodeposition papers recently presented in New York before the Electrochemical Society.

The paper on Nickel Plating critically outlined the various nickel baths with emphasis on post-war evaluation. Among those included were: 1. The hard type nickel solution, a high pH, hot sulphate-ammonium chloride solution operating at current densities up to 100 A.S.F. from which hard, abrasion resistant deposits can be obtained. These deposits are suitable for salvage and repair purposes and wherever an abrasion resistant deposit is necessary. Second, the chloride type of solution, simple of composition in which a wide range of plating conditions from low to high pH and low to very high current densities can be employed. The deposits produced are easily buffed and of intermediate hardness, covering a wide range of applications. This is also a highly efficient and economical bath to operate and easy to control. Its main disadvantage being a corrosive type of solution. Third, the hot sulphate Ni-Chloride, or Watts bath operated at either high or low pH and at current densities normally up to 100 A.S.F. The deposits are very soft and ductile at low pH and are suitable for forming or stamping operations. This bath is fairly easy to control and fairly efficient particularly at higher current densities and pH. This bath, however, is subject to pitting and contamination from foreign matter. The speaker also mentioned high speed nickel plating processes where current densities up to 4000 A.S.F. can be used, however, these will wait for post war development and use.

Following the speaker our "Shop Problems Session" was taken over by Harry Sanders. Problems presented and discussed were: Pitting of lacquer on zinc plate, while precipitate formation in Copper Cyanide, rochelle type solution, and excessive carbonate formation in copper cyanide rochelle type solution. The meeting adjourned at 10:30 P. M., after which the members partook of sandwiches, refreshments and group discussions.

S. ZAVARELLA, *Sec'y.-Treas.*

NEW HAVEN BRANCH

The opening session of the New Haven Branch on Sept. 14, 1943, at the Hotel Duncan, was very well attended by a large gathering of members and out of town guests.

President Walter T. Lynch appointed

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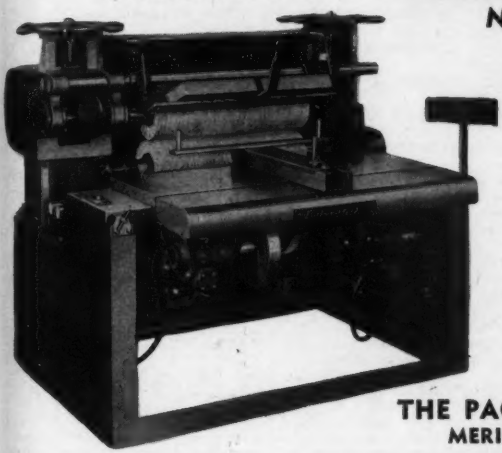

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Dr. H. L. Kellner of the Lea Manufacturing Co., our Educational Chairman. Dr. Kellner has been most successful in arranging a list of speakers who will give valuable lectures during the coming year.

The New Haven Branch was very fortunate in having Dr. Walter R. Meyer, Technical Director of the Enthone Company, for their first Educational Speaker. Dr. Meyer's talk was "Preparations of Metal for Plating, Bonderizing and Blackening," which described the use of various cleaning methods, such as alkaline cleaners and emulsion cleaners. Pickling methods and hydrogen embrittlement were also spoken of in detail. Dr. Meyer evaluated his lecture with various instructive films which raised much discussion and resulted in a lengthy but very successful opening meeting.

Beer and sandwiches were served under the supervision of Frank Kennedy, Manager of the Pilgrim Room at the Duncan, who did a little silver plating years ago at the R. Wallace & Sons in Wallingford and who enjoyed renewing acquaintances.

George Knecht who had had an attack of laryngitis was able to attend but Jack English is very sick still, and his friends join in wishing him a speedy recovery.

The meeting adjourned at 11:30 P.M.

B. J. GAFFNEY, *Sec'y-Treas.*

NEWARK BRANCH

The regular meeting of the Newark Branch of the A. E. S. was held at the Robert Treat Hotel, October 1st, 1943. The meeting was called to order by President William Bruhns at 8:30 P.M. All other officers were present.

The minutes of the previous meeting were read and approved.

An Application to Associate Membership of Eugene Hallett was voted to take the regular course.

The Secretary read a communication which he received from Walter Pinner with reference to the A. E. S. being represented on the B8 Committee together with the members of the A.S.T.M. A copy of a letter from Gus Sidelberg to Walter Pinner referring to the above mentioned subject was also read.

Our Librarian, Ed Washburn, reported that all arrangements had been made for the Afternoon Session on October 23rd, stating that some very prominent speakers had been engaged. Mr. Oldam next reported on the Smith-Wagner Testimonial Dinner, emphasizing the fact that his report was confidential and should not be mentioned to Smith or Wagner.

As there was no speaker scheduled for this meeting our Librarian took over and gave us a talk on coloring aluminum by the Chromic Acid Anodizing Process. This process is relatively new and Ed claimed that Mr. Tubbs of the Mutual Chemical Company has spent much of his time in developing it. Ed had with him numerous samples finished in a variety of colors and he explained the full process in detail. The members expressed their opinion that Newark Branch need not worry about regular speakers as long as Ed was acting as Librarian. He can certainly make the meeting interesting for the members.

There being no further business the meeting was adjourned at 11:00 P.M.

GEORGE WAGNER, *Secretary*

ROCHESTER BRANCH

The regular monthly meeting of the Rochester Branch of the American Electroplaters' Society was held Wednesday evening, October 13, at the Rochester Chamber of Commerce. Our usual meeting, the third Friday of every month, was changed this month because of the speaker for this meeting.

President John Q. Adams called the meeting to order at 8:15. Minutes of the previous meeting and financial report were read and approved.

New business was discussed and our Branch had ten members to attend the Buffalo Picnic. Mr. S. P. Gartland of the Rochester Branch will attend the Testimonial Dinner at New Jersey, October 23.

In the absence of Mr. William Tucker, the meeting was turned over to Mr. C. Henderschott, who acted as Educational Chairman and introduced

the speaker, Mr. Harry Cook of Eastman Kodak Company.

Mr. Cook gave a very interesting talk on ventilation for control of obnoxious vapors, fumes, mists and dusts. Each member was given an outline to follow the discussion. It is impossible to give all the accurate and concise information Mr. Cook elaborated on; but he certainly impressed all present with the necessity of proper exhaust and ventilation systems. All members agreed the information Mr. Cook had was very interesting and vital to everyone. We all extend our kindest thanks to Mr. Cook for his time and efforts, the members gave him a rising vote of thanks.

The meeting was adjourned at 10:30.

DONALD C. BLUM, *Secretary*

PITTSBURGH BRANCH

The Pittsburgh Branch of the A. E. S. held their regular meeting October 7th, at the Fort Pitt Hotel. The meeting was preceded by a dinner with twenty persons present.

Messrs. Taylor, Wakefield, and Martin were all elected as active members and application for membership was received from Mr. Phillip Simon of Beco Products Company of Rochester, Pa.

Following the short business meeting Mr. Klein of Goodrich Rubber Company gave a talk with moving pictures on "Koroseal and Tank Linings." An additional film from the Bureau of Mines on "Petroleum and Its Uses" was shown. The talk and both films were very interesting and well received.

The regular meetings of the Pittsburgh Branch for the balance of this season will be held 8:00 P.M. on the second Thursday of each month at the Fort Pitt Hotel instead of on the first Thursday of each month. Next meeting will be held Thursday, November 11th.

FRANK R. KELLER, *Secretary*

MILWAUKEE BRANCH

The regular meeting of the Milwaukee Branch was held October 1 in the Colonial Hall of the Republican Hotel. Mr. Robert Steuernagel, Jr., was back as presiding officer after missing last meeting because of an appendicitis operation.

The business session was taken care of before the regular meeting, inaugurating our new streamlining of business meetings. Highlight of the session was the announcement that since the purchase of new bonds, the Milwaukee Branch now possesses $2500 in War Bonds.

The meeting opened with the reading of the minutes of the previous meeting and was then turned over to Mr. William Geissman, our librarian, who introduced Mr. L. G. Tubbs of the Mutual Chemical Co. who spoke on "Anodizing Aluminum by the Chromic Acid Process." His talk was very timely and interesting. He spoke of the effect of temperature and current on anodic films; the thickness of film and how thick it should be; the life of the bath and chromic acid consumption; and the effect on different alloys. The large audience gave him an enthusiastic hand of applause.

Then Mr. Geissman introduced Mr. Guffee of the United Chromium, Inc., who spoke on "Hard Chrome Plating." Mr. Guffee had no trouble at all keeping the complete interest of the group on his subject. As a matter of fact, Mr. Guffee and Mr. Tubbs had quite a time trying to break away from the crowd who demanded information after the meeting. All in all it was a grand meeting with two splendid speakers and a real turnout.

I might add that if you are planning to attend any of the Milwaukee Branch meetings, come at 8 o'clock. Old business is taken care of before that time.

JAMES DURNFORD, *Secretary*

WATERBURY BRANCH

Waterbury Branch held its regular monthly meeting, Friday, October 8, at the Hotel Elton. The meeting was preceded by the usual dinner at 6:30 P. M., held in the Colonial Room.

At 8:00 P. M. in the absence of the President, Vice President, Tony Maz, opened the meeting. We regret that Carl Kilborn is still unable to be about, but are pleased to know that he is pro-

gressing favorably and should be back for the next meeting. The first report was on the financial status of the last regional meeting and we were pleased to learn that it was quite successful in this respect, the Branch sharing in a surplus.

Applications for membership acted upon favorably by the Board of Managers were from Donald Isaacs, Jack Bain and Merle M. Wetzel. When put to a vote, Donald Isaacs was elected an active member and Jack Bain and Merle M. Wetzel were elected associate members of the Waterbury Branch. New applications for membership have been received from William D. Gordon and Vernon F. Henley, and have been referred to the Board of Managers for approval.

Tony called attention to two meetings which should be of real interest to our members. The first is the Electrochemical Society Meeting in New York, from October 13 to October 16. Two sessions held Friday afternoon and Saturday morning will be of particular interest to platers as they cover various phases of Electrodeposition. On October 23 the Newark Branch is holding a testimonial dinner in honor of Horace Smith and George Wagner. In addition to the dinner, several speakers of real interest will be heard during the afternoon.

Particular attention was called to the business meeting of the branch which will be held October 22 at the home of Tony Maz, 52 Riverside Drive, Naugatuck. As many as possible are urged to attend as several important items of business will be transacted.

Technical Chairman, William Coleman, first introduced Dr. George Dubpernell, substituting for Jacob Hyner. George reviewed Glasstone's new book, "Fundamentals of Electrochemistry and Electrodeposition," published by the American Electroplaters' Society. George said he actually read the book from cover to cover, and really enjoyed it, finding it an excellent story of electrochemistry, a story from which the plater might learn a great deal about the fundamentals of electroplating.

Bill Starr, talking on priorities, discussed in some detail C M P Regulation No. 5, showing how a plater might proceed to obtain the materials for operation under this plan.

Bill Coleman next introduced our speaker, George Hogaboom, and noted that it was about twenty-five years ago that he served under Mr. Hogaboom in the Scovill Mfg. Co. Those years under his direction were interesting and proved very profitable. The Branch tries to have Mr. Hogaboom on the program at least once during each year, and we are indeed happy that he can be with us at this time.

Mr. Hogaboom, in opening up his talk, remarked that he had been fifty-five years in the Electroplating business, and now after all these years has just decided to retire. He expects to put his retirement to very good use as he has several hobbies to which he wishes to devote more time. Just prior to his retirement, Mr. Hogaboom served on the War Production Board in the branch dealing with Conservation and Substitution of Metals.

The work of this Board as the name implies, has been to find less critical metals to do the work of those metals which were needed for more important purposes, and where substitutions could not be made to find means of using less of these materials to obtain the desired results. Much has been accomplished and while the shortage is still critical, with continued conservation and careful allotment of materials, our supply should cover our needs for most metals.

Tremendous technical advances have been made in Electroplating due to this program, and most of the work will be applicable in the post war period to the great advantage of the plating industry although methods of plating will be quite different from what we have known in the past.

Everyone enjoyed Mr. Hogaboom's talk. Many questions were asked and at the conclusion he was given a rising vote of thanks.

The meeting was concluded by the showing of moving pictures, through the courtesy of the Lea Mfg. Company. The first film entitled "Highlights of the 1943 Convention" showed the various doings at Buffalo. The second

film, "Burring by the Wheel Method," showed how wheels should be set up and burrs removed from parts in production.

The meeting adjourned at 10:15 P.M.

S. L. HENN, *Secretary*

PROVIDENCE-ATTLEBORO BRANCH

The regular monthly meeting of Providence-Attleboro Branch was held on Monday evening, October 18th, in the Crown Hotel.

A splendid dinner preceded the meeting and, as guests, we were honored to have with us Fred Hampson of Holyoke. Mr. Frank Clark (Hanson-Van Winkle Company) the Librarian of the Springfield Branch and Father of our Branch, acted as toastmaster; he delighted the happy diners by his inimitable ability to keep everyone joyous, yet never did he allow them to stray far from the fact that the Society, of which they were members, offered them incalculable values and that by active membership they would most surely reap unlimited benefits.

After repairing to the Colonial Room, John T. Henry, Jr., the President, presented the speaker of the evening, Mr. Fred Hampson (Plating Processes Corp., Holyoke, Mass.) who, in a most informative manner, completely described and explained the workings of the "Electronic Tank Controller."

Mr. Hampson demonstrated the labor saving features and the many other salient points contained within his device and it was not until the speaker began to show signs of exhaustion, which was after several hours upon the platform, did the members allow him to rest. The session closed at a very late hour after extending a rousing vote of thanks to Mr. Hampson.

CHARLES C. CHACE, *Secretary*

NEWARK BRANCH

The regular meeting of the Newark Branch of the A. E. S. was held at the Robert Treat Hotel, October 15th, 1943. The meeting was called to order by President William Bruhns at 8:30 P. M. All other officers were present.

The minutes of the previous meeting were read and approved.

Two Applications to Active Membership of Arthur Granville Biedinger and James Eugene Onorato were voted to take the regular course.

Mr. George Klink proposed that we send our member, Mr. Hodecker Sr., who is confined to Newark Memorial Hospital, a box of cigars. This was adopted and the members were asked to also send him a card to cheer him up.

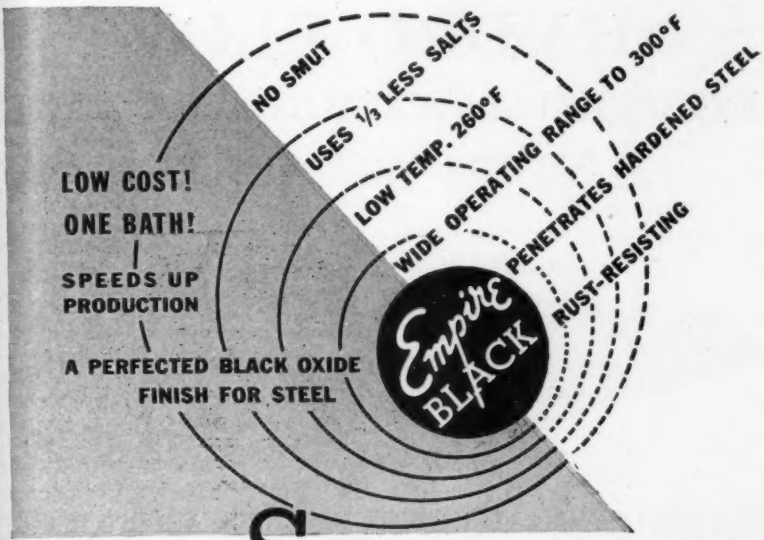
Ed Washburn and Paul Oldam reported that all arrangements for the Afternoon Session and the Testimonial for October 23rd had been completed.

It was next proposed that some incentive to attend meetings be worked out, possibly in the form of membership buttons to those having the best attendance at meetings during the year. After some discussion in which it was brought out that members should not look for an incentive in that form and that our Educational Session should be of such nature that members would be anxious to attend. It was then decided to table the matter. Mr. Horace Smith reported that Mr. Gardner, who had been a member of our Society some years ago, asked to be reinstated and Mr. Smith proposed that he be allowed reinstatement by just paying the present year's dues. This was adopted.

The speaker for the evening was Mr. Robert R. Sizelove. Bob had with him some equipment to demonstrate Super imposing AC current over DC current for zinc plating. He demonstrated to us how zinc could be deposited at a much higher current density with the Super imposing current. He also proved that the deposit was brighter. Numerous questions were asked after this demonstration and discussion and it was brought out that Super imposing current had greater possibilities and would be used on other solutions in the very near future. Bob was given a rising vote of thanks, after which our Librarian, Ed Washburn, conducted a Question Box.

The meeting was adjourned at 11:00 P.M.

GEORGE WAGNER, *Secretary*



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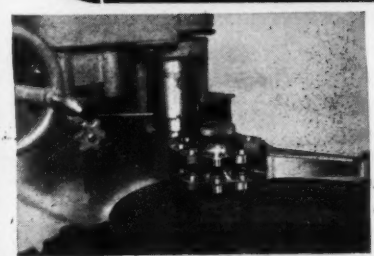

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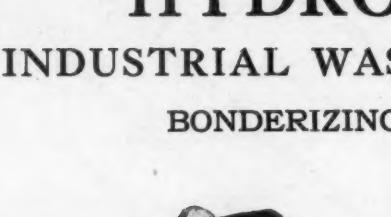

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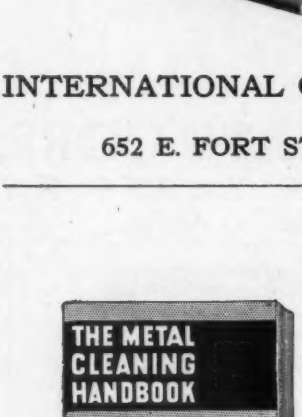

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CINCINNATI BRANCH

The Cincinnati Branch held its regular meeting at the Hotel Gibson, Thursday, October 28, 1943.

The meeting was called to order at 8:30 P.M. by our president, Mr. William B. Stoddard, Jr. The minutes of the last meeting were approved as read as was also the financial report. The recent communications were read and placed on file and all bills were approved to be paid.

A motion was then made to conduct our next meeting on November 18 due to Thanksgiving. At the request of the members, the secretary will inquire regarding the date of occupancy of the Herman Schneider Foundation which will be presented at our next regular meeting. A report was given on the War Production Committee established by the Technical and Scientific Societies Council of Cincinnati. The membership committee reported some progress and the application of Frank Peter Lester was voted to take the regular course to active membership.

Our guest for the evening was Mr. William Neill of the Dayton Branch. Mr. Neill presented to our members an interesting pep talk regarding the regional meeting that will be held at Dayton, Ohio, on November 6, 1943.

There being no further business, the meeting was adjourned.

ELLIOTT W. HORNING, *Sec'y-Treas.*

BRIDGEPORT BRANCH

The regular monthly meeting of the Bridgeport Branch of the American Electroplaters' Society was held Oct. 1, 1943, at the Chamber of Commerce Rooms, Stratfield Hotel. President A. R. McNeil opened the meeting with 29 members present.

The roll call of officers was read and Wilbur Stratton, Board of Managers, and F. B. Gotthardt, Chairman of the Sick Committee were reported absent. The minutes of the previous meeting were read and accepted.

Reports of Special Committees:

No special committees appointed at this time.

Reports of Standing Committees:

J. G. Sterling reported no sickness during the past month. A floral wreath was sent to the family of Wilbur Stratton whose son has passed away. A card was received by the Branch thanking the members for their kind expression of sympathy. Hubert Goldman, Chairman of the Membership Committee reported progress with prospective new applications for membership.

John E. Charleson, our Librarian and Technical Session Chairman, with the assistance of A. R. McNeil, C. C. Helmle and Larry Griffin have made arrangements to hold an Educational Session and Open Meeting, Friday, Oct. 22, 1943, at 8:00 P.M., at the South Parlor, Stratfield Hotel. We will have motion pictures of "Scenes and Personalities" at the 1943 A. E. S. Convention in Buffalo." Also, setting up a greaseless compound polishing wheel (in color). And at 8:30 P.M., Mr. Arthur Lagozzo of the Hartford Chrome Corp., will speak on "Hard Chromium Plating" and an open discussion of Mr. Lagozzo's paper will follow at 9:45 P.M. A Clinic on Finishing will be in session with consultants who are experts in the finishing industry. They are as follows:

Dr. Walter R. Meyer
Mr. F. Erlenmeyer
Mr. R. J. O'Connor
Mr. C. C. Helmle

We may mention also that letters were sent out to plant and factory managers in Bridgeport and Stamford and to some of the members of the Hartford, New Haven and Waterbury Branches with the view of having a good attendance at the Session. Arrangements were made also for publication of this fine affair in the Bridgeport Post and Telegram.

Communications:

A letter from the Electrochemical Society inviting us to take our part at their meeting in New York, Oct. 13 to Oct. 16, 1943, at New York City. A very fine letter indeed and all who may attend the fall meeting of the Society will benefit greatly from the good sessions given by the Electrochemical Society.

A letter from the 1st Supreme Vice President, Mr. N. R. Caldwell giving us

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a list of speakers. This was turned over to Librarian, J. E. Charleson.

Applications for Membership: None.

Balloting for Membership:

George H. Goddu, City Plating Works, Bridgeport, Conn. Associate Member.

Louis W. Raymond, City Plating Works, Bridgeport, Conn. Active Member.

Roger E. Reath, City Plating Works, Bridgeport, Conn. Associate Member.

Reno S. Smith, Singer Mfg. Co., Bridgeport, Conn. Associate Member.

Melvin G. Crandell, Parker Rust Proof Co., 14 Iroquois Road, Ossining, New York. Associate Member.

S. Allen Heenan, General Electric Co., Bridgeport, Conn. Associate Member.

President A. R. McNeil introduced Mr. Heenan to all the members present.

Unfinished Business:

A motion was made and seconded to pay Mr. Wm. A. Ehrencrona for use of his estate, a sum of $15.00. The Branch wishes to acknowledge respects to both Mr. and Mrs. W. Ehrencrona for their fine co-operation at this outing.

New Business:

Two members of the Bridgeport Branch, Samuel Gordon and Andrew Pochna were taken into the Armed Forces. We now have four members in the U. S. Armed Service.

Bills against the Branch were ordered paid.

Good of the Order:

A discussion was held to hold open meetings during the next two or three months with a view of holding these meetings regularly to have good technical sessions. If the attendance to these meetings is good, we expect to continue with the opening meetings each month with the possibility of scheduling future meetings regarding the dates and the speakers.

The treasurer's report was read and accepted.

JOSEPH G. STERLING, *Sec'y-Treas.*

LOS ANGELES BFANCH

The regular monthly meeting of the Los Angeles Branch was held at the Rosslyn Hotel, Monday, Oct. 11, 1943.

The meeting was called to order by President Holman.

Mr. Stanley Rynkof, Sergeant at Arms, introduced the following visitors. Mr. Renolds, Mr. Briston and Mr. Wilder of Adel Precision Co. Mr. Poters, Mr. Gardner and Mr. Sims of Los Angeles Plating Co. Mr. Weaver and Mr. Artran of General Air Condition.

Meeting was turned over to the Librarian who introduced the speakers of the evening. Mr. Beall, Chemical Engineer of Harshaw Chemical Co., who gave a talk on lead plating, and Mr. Artran of General Air Condition. who gave a talk on ventilation of the plating room. Both talks were very interesting and were promised for publication in the Review.

Five minute recess.

Visitors were excused. President Holman called the business meeting to order. Minutes and financial reports were read and approved.

Clarence G. Spence was reinstated as an active member. Charles H. Wells George Coubough, Leo Brame and A. L. Speser were voted and accepted as members. Mr. Speser was initiated.

The resignation of Ervin Frauenhoff was read and accepted with regrets.

The members present voted that the Branch buy a $500.00 war bond. Mr. E. Lamoureux was appointed to purchase and be custodian of same.

Names of members that are back in their dues were read and the list turned over to the Board of Managers.

Meeting adjourned 10:45.

C. C. McLAREN, *Secretary*

GRAND RAPIDS BRANCH

Minutes of the Grand Rapids Branch of the American Electro-Platers meeting which was held in the English Room of the Rowe Hotel, Friday Evening, October 8th, 1943.

The session was called to order at 8:30 P.M. by our President, Homer Morton. Reports of Committees and communications were read.

Two applications were presented for membership, Albert J. Nook and Lewis

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Parker of the Kalamazoo Plating Works. These applications were referred to the Board to be voted upon during the November meeting.

Again we had a record attendance for this second meeting of the year, and the officers are in hope that the large attendance will continue throughout the season.

The active Educational Committee attained for this meeting Mr. R. B. Saltonstall of the Udylite Corporation who gave a very extended and descriptive talk on "Zinc Plating and Dichromating of Steel Parts." Dick Saltonstall's talk was one of the most popular that we have had come before this Branch, and his response to the questions asked by the members was most educational and to the point.

An announcement was made of our annual Dinner-Dance to be held January 15th. Those committee members who are working on this Annual Educational Session are now compiling all data and special meetings are being held to make this annual affair successful.

The Rowe was again prepared to serve the popular lunch with beer and the meeting was then adjourned.

C. E. ABEL, *Sec'y-Treas.*

BALTIMORE-WASHINGTON BRANCH

The first meeting of the Baltimore-Washington Branch for the season was held at Telford's Buffeteria on October 16, 1943. Dinner was served to 33 members, and 36 members were present at the meeting. President Warnock presided at the meeting. Mr. Charles Allen Rice of the WPB was elected into membership, and four membership applications were presented. It was decided to hold the December meeting in Baltimore.

The speaker for the evening was Mr. Nathan E. Promisel, of the Bureau of Aeronautics, Navy Department, who spoke on "The Cadmium Situation and the Use of Zinc as a Substitute."

Mr. Promisel pointed out that 80% of the Cadmium production goes into electroplating and most of this is used on airplanes. The requirements for

cadmium plating are increasing more rapidly than the rate of production, and this makes it imperative to substitute zinc for cadmium wherever possible. Cadmium is superior to zinc in salt spray and in salt immersion, and does not produce as voluminous corrosion products. However, zinc is superior in industrial and sea coast exposures.

Contrary to popular opinion, zinc plated parts may be used in contact with aluminum. Cadmium is superior to zinc for use on Carburetor and Magneto parts, on external engine parts, on electrical contacts and on parachute fittings. Zinc is not used on the latter because it is said to rot cotton fabrics. Zinc may be substituted for cadmium on propellor assemblies, landing gear, tools, and brackets.

Since zinc has a smaller electrochemical equivalent and density than cadmium, about a 60% increase in plant capacity is required to substitute an equal thickness of zinc for cadmium. However, if 0.0005 inch of zinc is required as a substitute for 0.0002 inch of cadmium, about 165% increase in capacity is required.

ABNER BRENNER, *Secretary*

TOLEDO BRANCH

A regular meeting of the Toledo Branch of the A. E. S. was held Oct. 7th, 1943, at the Hilcrest Hotel.

The meeting was called to order at 8:15 o'clock P.M. by the President Mr. Dressel.

Minutes of the previous meeting were approved as read. No old or new business brought up.

The application of Elmer Hurley for an associate member was approved. A motion by Mr. Vannorsdall to accept Mr. Hurley's application was seconded by Mr. St. Arnaud and unanimously passed.

A representative of the United Chrome Corp. of Detroit, Mich., read a paper on hard chrome plating.

The meeting adjourned at 9:45 P.M.

G. C. BERGEMAN, *Secretary*

SYRACUSE BRANCH

The first meeting of the 1943-44 season Syracuse Branch of the A. E. S.,

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was held at Tobin's Fairmont, Syracuse, with a dinner meeting, Friday, September 10, with about 25 in attendance. In spite of rationing (or perhaps because of it) a splendid dinner was served.

After the dinner considerable time was given to discussing ways and means to create lively up-to-the-minute educational meetings. Plenty of those present had ideas which we are hoping will be used this season.

Our President, Dr. Murphy, informed us that the University will again be available for our meetings, for which we are all grateful. A Membership Committee, composed of Mr. George Skinner, of the Easy Washer Corp., Mr. Geo. Lawrence of the Wyandotte Chemical Corporation, and Mr. Harry Herlikofer of the Magnus Chemical Corp., was elected.

We were glad to welcome to this affair two of our new members recently transferred from the late Binghampton Branch. Mr. Harry Herlikofer and Mr. Wm. Maher. Mr. Maher came all the way from the Watervliet Arsenal where he has charge of the Plating Department. Very glad to see them both and we hope it will be possible for more of those transferred members to visit us.

The Secretary was instructed to write Mr. Austin Fletcher of Binghampton, who was elected our official delegate to the Buffalo Convention, to try and get to our October meeting with his report. We are hoping he can make it.

Mr. Paul Swartz, our Librarian, brought along the cup our Branch (won??) at the Convention for the membership increase last year. It seemed to be the general opinion that we hadn't done too much to win that cup as it was the fact of the Binghampton transfers that put us in the lead. However, we also feel that for a new branch we haven't done too badly in the way of membership.

Two applications for membership were received and acted upon. Mr. Costa of the Benedict Silver Corp., and Mr. Renner of the Scobell Chemical Corp.

The resignation of Mr. Paul Kram-

arcik was read and acted upon with expressions of regret.

The next meeting will be held at Bowne Hall, Syracuse University, Friday, November 12, with Mr. Digin of the Hanson-Van Winkle-Munning Co. as speaker. His subject will be "Zinc Plating and Protective Films on Zinc."

GEORGE SIMMONS, *Sec'y-Treas.*

BOSTON BRANCH

Boston Branch met Thursday, Nov. 4th, at the Statler Hotel with Pres. Swift in the chair.

Minutes of the previous meeting read and approved.

Communications read and placed on file, bills ordered paid.

A letter of condolence was sent to our librarian, Bob Magunson, extending the sincere sympathy of all the members of Boston Branch in the loss of his mother.

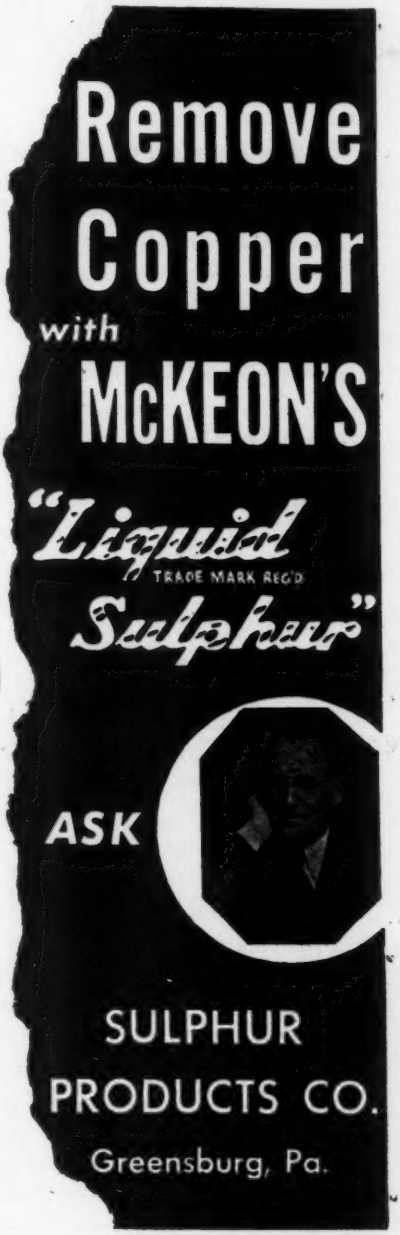
One application was read for the second time and approved by the board of managers and elected to membership Charles F. Mahoney, 4 Washington Ave., Winthrop, Mass., Asso., the transfer of Andrew W. Liger of Dayton Branch was accepted by the Branch; one application was read for the first time and turned over to the board of managers for approval Salvatore Aversa, 189 Clare Ave., Hyde Park, Mass., Active.

A motion was made that an appropriation of $50. be given the membership chairman to be used in his drive for new members.

With all business out of the way we had as the speaker, Myer Shacat of the United Chromium Corp. His talk was "Hard Chrome Plating." A report will be sent along by the acting librarian. The pictures of the 1943 convention held at Buffalo and also a picture of the use of Lea compound both were very good and there were more questions asked Myer Shacat than were ever heard at a meeting of Boston Branch. A vote of thanks was given the speaker and Earl Couch for a very fine evening.

Meeting adjourned at 11 P. M.

A. W. GARRETT, *Sec'y-Treas.*



BOOK DEPARTMENT

BOOK REVIEWS

By

DR. GEORGE DUBPERNELL, *United Chromium, Inc.*

Principles and Applications of Electrochemistry. Volume I. Principles. H. Jermain Creighton. Fourth Edition, 477 pages. John Wiley & Sons, Inc., New York. 1943. Price $5.00.

This is a new fourth edition of what is probably the outstanding American theoretical textbook of the subject. While there are twenty-five fewer pages than the third edition, the content is probably greater owing to the use of several more lines per page, and more words per line, without changing the size of type, however. In spite of these changes, the overall size of the book is somewhat reduced by trimming the margins more closely to effect paper economy in compliance with War Production Board recommendations, and this, together with a green instead of a red cover, makes a somewhat different appearing volume than the earlier editions.

Professor Creighton states in the Preface that: "In the present edition of Principles of Electrochemistry the entire text has been revised. This has afforded an opportunity of not only adding a number of new topics and deleting old material, but also of making many minor changes in the nineteen-year-old framework of the volume. The more important changes are as follows: (1) new sections have been introduced which deal with the structure and properties of the electric double layer, the study of electrophoresis by the moving-boundary method, streaming potentials, polarographic analysis, the Wien effect, and glow discharge electrolysis; (2) the sections on fused electrolytes, the glass electrode, the applications of potentiometric measurements, the applications of electro-osmosis and electrophoresis, overvoltage, electrochemical reduction, and electrochemical action in gases have been extended; (3) several new figures and tables of data have been included."

While numerous minor revisions have been made throughout as indicated, there would appear for the most part to be no compelling reason for owners of a copy of the second or third edition to purchase the fourth edition, unless general up-to-dateness or a special subject are of importance. It is still the same book. The chapter headings and structural outline are the same as previous editions. In the opinion of

the reviewer, there have been no important advances of a fundamental nature in theoretical electrochemistry since about the time this book first appeared; consequently, there could be but little change in subsequent editions since it was well written to start with.

The book contains quite detailed consideration of the experimental data in its field. The literature is extensively reviewed, and references commonly run as high as five to ten or more per page throughout. The mathematics of each subject is included and seldom, if ever, minimized. This is perhaps necessary since the book is probably used mainly as a textbook for college classes. Problems for student use are given at the end of almost every chapter.

Aside from some applicable theory, the electrodeposition of metals is only discussed directly in one or two pages, and reference is made to Volume II of the book, "Applications," by W. A. Koehler, published in 1935, for a detailed consideration of electroplating and related subjects. This does not seem a very satisfactory situation to the reviewer, who believes that for best results theory and practice should be combined.

The subjects covered by the twenty-four chapters are as follows: Introduction, Faraday's Laws, Theory of Electrolytic Dissociation, Process of Electrolytic Dissociation and Conductance, Electrolytic Conductance of Solutions, Migration of Ions, Electrokinetic Phenomena, Electromotive Force, Concentration Cells, Oxidation-Reduction Cells, Polarization, Depolarization, Application of the Law of Mass Action, Activity of Strong Electrolytes, Theories of Strong Electrolytes, Relations Between Chemical Structure and the Dissociation Constant, Homogeneous Equilibria, Dissociation of Water, Hydrolysis, Avidity of Acids and Bases, Theory of Neutralization Indicators and Its Application to Volumetric Analysis, Ampholytes, Heterogeneous Equilibria, and the Electrochemistry of Gases. The book is well indexed both as to authors and subjects.

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MEMBERSHIP REPORT

CLARENCE C. HELMLE
Chairman, Membership Committee

To December, 1943

ELECTIONS

Baltimore-Washington Branch

CHARLES ALLAN RICE, 634 Webster St., N.W., Washington, D. C., Associate
DAVID RAYMOND MOUL, 138 Mankin Walk, Hillwood Square, Falls Church, Virginia, Active
JOHN C. WILHELM, 2715 E. Madison St., Baltimore, Md., Associate
ALBERT GRANT TAYLOR, c/o Rheem Mfg. Co., 1209 E. 25th St., Baltimore, Md., Active
HAROLD S. HEDBERG, 4 Maple Drive, Catonsville, Md., Associate

Boston Branch

CHARLES F. MAHONEY, 4 Washington Ave., Winthrop, Mass., Associate

Buffalo Branch

HARRY K. GIPP, 145 Hawthorne, Buffalo 14, New York, Active
ANTHONY CONTI, Colonial Radio Corp., Buffalo, New York, Associate
LOUIS A. FRICANO, 130 Dante Place, Buffalo 2, New York, Active

Chicago Branch

J. H. GREENBERG, c/o Perfection Gear Co., 152nd St. and Vincennes Ave., Harvey, Ill., Associate
P. A. SPRINGER, 1321 Wolfram St., Chicago, Ill., Associate.
G. H. CARTER, 4154 Baldwin St., Culver City, Calif., Associate
C. PROKUSKI, 2150 N. Keeler Ave., Chicago, Ill., Associate
W. C. ST. CLAIR, 1713 W. 8th St., Des Moines, Iowa, Active
H. F. PRUTER, 1134 S. Mayfield Ave., Chicago, Ill., Active
J. A. DEIBEL, 3909 W. Monroe St., Chicago, Ill., Active
F. J. LELUAN, 831 N. Marshfield Ave., Chicago, Ill., Active
J. E. BRADY, 1306 S. 59th Ave., Chicago, Ill., Active
J. J. BUEHLER, 1639 S. 51st Ave., Cicero, Ill., Active
H. SCHUPPE, 216 Lathrop Ave., Forest Park, Ill., Active
M. B. SURY, 1060 N. Marshfield Ave., Chicago, Ill., Active
J. R. BYERLEY, c/o Dixie Electroplating Co., Inc., 3001 Engelike St., Houston, Texas, Active
J. A. ANDERSON, 4846 N. Paulina St., Chicago, Ill., Active
D. B. RIED, 539 Goshen Ave., Elkhart, Ind., Associate

Dayton Branch

JOHN W. ALBAUGH, Alpha, Ohio, Active
WILLIAM H. MOHR, 1907 Trinity Ave., Dayton, Ohio, Associate

Grand Rapids Branch

ALBERT J. NOOK, Kalamazoo Plating Works, Kalamazoo, Michigan
LEWIS PARKER, Kalamazoo Plating Works, Kalamazoo, Michigan

Hartford Branch

R. H. PELLINGTON, 487 Broad St., Windsor, Conn., Associate
ANGELO IANETTA, 410½ Garden St., Hartford, Conn., Active

Indianapolis Branch

ALVIN W. CALDWELL, R. R. #1, Marion, Ind., (Wiley & Lett), Active

Los Angeles Branch

JOHN F. BEALL, 2424 Enterprise St., Los Angeles, Calif., Associate
LEO BRAME, 5852 Lanto Bell, Calif., Active
GEORGE COUBOUGH, 405 W. 64th St., Inglewood, Calif., Active
SIDNEY F. HILL, 2600 So. San Pedro St., Los Angeles, Calif., Associate
CLARENCE E. SPENCE, 528 E. 15th St., Los Angeles, Calif., Active
ALBERT L. SPISER, 1550 No. Lake St., Pasadena, Calif., Active
CHARLES HOULDER WELLS, 124 W. Sycamore St., El Segundo, Calif., Active
DEAN D. WILLIAMS, 2728 W. 42nd St., Los Angeles, Calif., Associate

Montreal Branch

HENRY GEORGE LAPIERRE, 1970 Notre Dame St., W., Montreal, Canada, Active

Newark Branch

EUGENE DOUGLAS HALLETT, P. O. Box 26, West Englewood, New Jersey, Associate
FRED W. MANTHEY, 6932 66th Place, Glendale, New York, Associate
FRANK MORGAN HINES, 86 Hamilton Ave., Dumont, New Jersey, Associate

New Haven Branch

HOWARD E. CHRISTIE, 77 Broad St., Groton, Conn., Active
JOHN HENRY GORMELY, 122 Piper Road, Hamden, Conn., Active

New York Branch

JOHN SCHAFFER, 408 Burlington Rd., River Edge, N. J., Associate
ARTHUR E. CARLSON, General Chemical Co., Engineering Service Division, Edgewater, N. J., Associate
S. LOUIS ROMEO, 104 Cherry St., New York, N. Y., Active
JACK MAISEL, 1181 Eastern Parkway, Brooklyn, N. Y., Associate

Philadelphia Branch

W. H. HOGG, 36 Mayfield Rd., Sutton Coldfield, nr, Birmingham, England, Associate
HORACE F. McINTYRE, 36 W. Johnson St., Philadelphia, Pa., Associate

Providence-Attleboro Branch

HARRY F. BURNS, 164 Leroy St., Attleboro, Mass., Active

GRANVILLE E. ROBBINS, 34 Forest St., Attleboro, Mass., Active

Rochester Branch

C. WARREN MAXWELL, 224 Ellicott St., Rochester, N. Y., Associate

Toledo Branch

ELMER B. HURLEY, Nelson J. Quinn Co., 1701 Oakwood Ave., Toledo, Ohio, Associate

Toronto Branch

A. MICHAEL BROWN, 2904 Yong St., Toronto 12, Ont., Apt. 609 ,Associate
FRANK L. JAMES, 25-A Dentonville Rd., London N1, England, Associate
ROBERT P. CRAWFORD, 135 Weber St., Kitchener, Ont., Apt. 12, Active
MELVIN S. GREEN, 54 Chudleigh Ave., Toronto 12, Ont., Associate

Waterbury Branch

R. LEWIS STUBBS, Zinc Development Association, Lincoln House, Turl St., Oxford, England, Associate

APPLICATIONS

Boston Branch

SALVATORE AVERSA, 189 Clare Ave., Hyde Park, Mass., Active

Bridgeport Branch

BRUCE LAURIER TAYLOR, 70 Third St., Stamford, Conn., Associate
VIRGILIO S. CONSALVO, 464 Park Place, Bridgeport, Conn., Associate
VINCENT J. DE NAPLES, Ralehar Road, Noroton Heights, Conn., Associate

Cincinnati Branch

FRANK PETER LESTER, 953 Goss Rd., Cincinnati, Ohio

Hartford Branch

MYRON M. ZERVAS, 80 Rowe Ave., Hartford, Conn., Active
PETER K. PAWLY, DuLite Chemical Corp., Middletown, Conn., Associate
WILLIAM R. MILLER, The Napier Co., Meriden, Conn., Active
JOHN H. TOTZ, The Napier Co., Meriden, Conn., Active
ARTHUR CARR, Prentice Mfg. Co., Kensington, Conn., Associate

Newark Branch

WILBERT THEODORE BUCK, 477 Franklin Ave., Belleville, N. J., Associate
ARTHUR GRANVILLE BIEDINGER, 316 Second Ave., Lyndhurst, N. J., Active
JAMES EUGENE ONORATO, 111 Paterson Ave., Paterson, N. J., Active
GEORGE LeROY HUBER, 597 Bergen St., Newark, N. J., Associate
JOHN P. KANE, 1223 Cliffwood Drive, Cliffwood, N. J., Active
JOHN T. OWEN, Merck & Co., Inc., Rahway, N. J., Associate

New York Branch

HENRY HAAS, Rex Products Corp., New Rochelle, N. Y., Active
GEORGE HAAS, Wright Aeronautical Corp., Paterson, N. J., Active

Philadelphia Branch

PETER A. VADURRO, Active
CHARLES H. BURRIS, JR., Associate
EDWARD J. HEIN, Associate
PERSIFER B. KENNEDY, Associate
EDWARD V. TAPP, Associate

Providence-Attleboro Branch

WILLIAM H. BROUN, 216 Slater St., Attleboro, Mass., Active
WILLIAM H. DWYER, 193 Towne St., N. Attleboro, Mass., Active
MAX MARKMAN, Reynolds & Markman, Attleboro, Mass., Associate
WILLIAM REYNOLDS, Reynolds & Markman, Attleboro, Mass., Associate
WILLIAM C. FREIMUTH, 130 N. Washington St., N. Attleboro, Mass., Associate
SIBLEY E. KERSHAW, 151 Friendly Rd., Cranston, R. I., Active

Syracuse Branch

MANNIE F. COSTA, 147 N. Cullingwood Ave., Syracuse, N. Y., Active
MORROW A. RENNER, 209 E. Warrington Rd., Syracuse, N. Y., Associate

Toronto Branch

HARRY DYER, Bomac Electrotype Co., 246 Richmond St., Toronto, Canada, Active
ERNEST MOSS, 14 Mulberry Cres., Toronto, Ont.

Waterbury Branch

D. A. PALMER, Joseph Rodgers & Sons, Ltd., Sheffield, England, Associate

CHANGE IN STATUS

Boston Branch

HARRY M. SAULSBERG from Associate to Active Membership

TRANSFERS

ROBERT E. PURKISS from Cincinnati Branch to Indianapolis Branch
P. BLOOM from Chicago Branch to Buffalo Branch

RESIGNATIONS

ERVIN FRAUENHOFF, Los Angeles Branch
S. DEMBICKI, Montreal Branch
PAUL C. KRAMARCIK, Syracuse Branch
J. J. PETOCK, Buffalo Branch

SUSPENSIONS

Baltimore-Washington Branch

HUME F. MOLTER
ROBERT L. McGILL
FRANK H. BOCK
JOHN W. SHANKLIN
FRANK COLLINS

New York Branch

CHARLES BERLIN
J. SCAPOLLITE

Los Angeles Branch

M. H. BIDERMAN
W. C. BROKUS
H. C. CARICKER
E .O. FOSTER
R. HINKEL
H. H. MORRELL
R. MUNOZ
F. E. SHAW, SR.
V. STABILE
R. R. WILDE

DEATHS

WILLIAM HARRISON, Newark Branch
G. A. SPENCER, Chicago Branch

MEMBERSHIP CHART

BRANCH	May 1943	Change in Membership	Percent Change
HARTFORD	72	+28½	+39.5
ST. LOUIS	83	+26	+31.3
BUFFALO	63	+16½	+26.1
CINCINNATI	55	+ 9	+16.3
SAN FRANCISCO	34	+ 5	+14.7
GRAND RAPIDS	87	+12	+13.7
CLEVELAND	105	+13½	+12.8
PITTSBURGH	55	+ 6	+10.9
SPRINGFIELD	70	+ 7½	+10.7
BRIDGEPORT	78	+ 7½	+ 9.6
NEWARK	174	+15	+ 8.6
TOLEDO	37	+ 3	+ 8.1
CHICAGO	278	+20½	+ 7.3
TORONTO	95	+ 7	+ 7.3
MONTREAL	50	+ 3	+ 6
NEW YORK	139	+ 6	+ 4.3
BALT.-WASHINGTON	98	+ 4	+ 4
WATERBURY	106	+ 4	+ 3.7
PHILADELPHIA	132	+ 3	+ 2.2
SYRACUSE	46	+ 1	+ 2.1
INDIANAPOLIS	60	+12½	+ 2
DETROIT	280	+ 5	+ 1.7
JACKSON	....	....	....
MILWAUKEE	93	− ½	− .5
DAYTON	96	− 1	− 1
BOSTON	117	− 2½	− 1.2
LOS ANGELES	117	− 4½	− 3.8
ROCHESTER	86	− 4	− 4.6
LANCASTER	43	− 3	− 6.9
ANDERSON	30	− 3½	−11.6
NEW HAVEN	103	−13½	−13.1
PROV.-ATTLEBORO	54	− 8½	−15.7

MEMBERSHIP MAY 1, 1943 = 2936
MEMBERSHIP DEC. 1, 1943 = 3064
GAIN IN MEMBERSHIP = 128
Percent of Gain 4.3%

BUYERS' GUIDE

ABRASIVES

Baker Co., M. E., Cambridge, Mass.
Buckingham Products Co., The, Detroit, Mich.
Burns, E. Reed Mfg. Corp., Brooklyn, N. Y.
Divine Brothers Co., Utica, N. Y.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harrison & Co., Inc., Haverhill, Mass.
Kocour, Chicago, Ill.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
Roberts Rouge Co. The, Stratford, Conn.
Stevens, Inc., Frederic B., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

ACTIVATED CARBONS

Baker Co., M. E., Cambridge, Mass.
Darco Corporation, New York 17, N. Y.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio
Industrial Filter & Pump Mfg. Co., Chicago, Ill.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
McGean Chemical Co., Cleveland, Ohio
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

ALKALIES

Detrex Corporation, Detroit, Mich.
Harshaw Chemical Co., The, Cleveland, Ohio

ANODES—BRASS

American Brass Co., The, Waterbury, Conn.
Harshaw Chemical Co., The, Cleveland, Ohio
Stevens, Inc., Frederic B., Detroit, Mich.

ANODES—CADMIUM

Baker Co., M. E., Cambridge, Mass.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
McGean Chemical Co., Cleveland, Ohio
Stevens, Inc., Frederic B., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

ANODES—COPPER

American Brass Company, The, Waterbury, Conn.
Baker Co., M. E., Cambridge, Mass.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
McGean Chemical Co., Cleveland, Ohio
Seymour Mfg. Co., The, Seymour, Conn.
Stevens, Inc., Frederic B., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

BUYERS' GUIDE

ANODES—GOLD

Baker & Co., Inc., Newark, N. J.
Baker Co., M. E., Cambridge, Mass.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
Stutz Mfg. Co., Geo. A. Chicago, Ill.

ANODES—LEAD

Baker Co., M. E., Cambridge, Mass.
Enthone Co., New Haven, Conn.
Hanson-Van Winkle-Munning Co., Matawan, N. J.

ANODES—LEAD

Harshaw Chemical Co., The, Cleveland, Ohio
Heil Engineering Co., Cleveland, Ohio
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
McGean Chemical Co., Cleveland, Ohio
Puritan Mfg. Co., The, Waterbury, Conn.
Storts Welding Co., Meriden, Conn.
Stevens, Inc., Frederic B., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.
U. S. Stoneware Co., The, Akron, Ohio

ANODES—NICKEL

Baker Co., M. E., Cambridge, Mass.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio
Hay Co., Jacob, Chicago, Ill.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
McGean Chemical Co., Cleveland, Ohio
Puritan Mfg. Co., The, Waterbury, Conn.
Seymour Mfg. Co., The, Seymour, Conn.
Stevens, Inc., Frederic B., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

ANODES—RHODIUM

Baker & Co., Inc., Newark, N. J.
Baker Co., M. E., Cambridge, Mass.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
Stutz Mfg. Co., Geo. A., Chicago, Ill.

ANODES—TIN

Harshaw Chemical Co., The, Cleveland, Ohio

ANODES—ZINC

Baker Co., M. E., Cambridge, Mass.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Meaker Co., The, Chicago, Ill.
McGean Chemical Co., Cleveland, Ohio

ANODES—ZINC

Seymour Mfg. Co., The, Seymour, Conn.
Stevens, Inc., Frederic B., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

BARRELS—BURNISHING

Abbott Ball Co., The, Hartford, Conn.
Baker Co., M. E., Cambridge, Mass.
Brown Machine & Tool Co., L. P., Attleboro, Mass.
Globe Machine & Stamping Co., Cleveland, Ohio
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Puritan Mfg. Co., The, Waterbury, Conn.
Stevens, Inc., Frederic B., Detroit, Mich.
Sturgis Products Co., Sturgis, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

BUYERS' GUIDE

BARRELS—PLATING

Baker Co., M. E., Cambridge, Mass.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Meaker Co., The, Chicago, Ill.
Puritan Mfg. Co., The, Waterbury, Conn.
Stevens, Inc., Frederic B., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

BARRELS—TUMBLING

Baker Co., M. E., Cambridge, Mass.

BLACK OXIDE PROCESSES

Alrose Chemical Co., Providence, R. I.
Baker Co., M. E., Cambridge, Mass.
Empire Solvents Corp., New York, N. Y.
Enthone Co., New Haven, Conn.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
MacDermid, Inc., Waterbury, Conn.
Mitchell-Bradford Chemical Co., Bridgeport, Conn.
Puritan Mfg. Co., The, Waterbury, Conn.
Stevens, Inc., Frederic B., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Sulphur Products Co., Greensburg, Pa.

BUFFING COMPOUNDS

Baker Co., M. E., Cambridge, Mass.
Buckingham Products Co., The, Detroit, Mich.
Burns Mfg. Corp., E. Reed, Brooklyn, New York
Divine Brothers Co., Utica, N. Y.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harrison & Co., Inc., Haverhill, Mass.
Hay Co., Jacob, Chicago, Ill.
Kocour Co., Chicago, Ill.
Lasalco, Inc., St. Louis, Mo.
Lea Mfg. Co., The, Waterbury, Conn.

BUFFING COMPOUNDS

L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Puritan Mfg. Co., The, Waterbury, Conn.
Roberts Rouge Co., The, Stratford, Conn.
Seeley Company, E. E., Bridgeport, Conn.
Stevens, Inc., Frederic B., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corporation, The, Detroit, Mich.

BUFFFING MACHINES—AUTOMATIC

Acme Mfg. Co., Detroit, Mich.
Baker Co., M. E., Cambridge, Mass.
Divine Brothers Co., Utica, N. Y.
Packer Machine Co., The, Meriden, Conn.

BUFFS

Advance Polishing Wheels, Inc., Chicago, Ill.
Baker Co., M. E., Cambridge, Mass.
Buckingham Products Co., The, Detroit, Mich.
Burns Mfg. Corp., E. Reed, Brooklyn, New York
Divine Brothers Co., Utica, N. Y.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Hay Co., Jacob, Chicago, Ill.
Kocour Co., Chicago, Ill.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Puritan Mfg. Co., The, Waterbury, Conn.
Stevens, Inc., Frederic B., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

BURNISHING BALLS

Abbott Ball Co., The, Hartford, Conn.
Baker Co., M. E., Cambridge, Mass.
Hanson-Van Winkle-Munning Co., Matawan, N. J.

BUYERS' GUIDE

BURNISHING BALLS

Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Stevens, Inc., Frederic B., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.

BURNISHING COMPOUNDS

Baker Co., M. E., Cambridge, Mass.
Gumm Chemical Co., Frederick, Kearny, N. J.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Magnus Chemical Co., Inc., Garwood, N. J.
Magnuson Products Corp., Brooklyn, N. Y.
Oakite Products, Inc., New York, N. Y.
Puritan Mfg. Co., The, Waterbury, Conn.
Stevens, Inc., Frederic B., Detroit, Mich.
Sturgis Products Co., Sturgis, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Wyandotte Chemicals Corp., Wyandotte, Mich.

BURRING COMPOUNDS

Baker Co., M. E., Cambridge, Mass.
Buckingham Products Co., The, Detroit, Mich.
Burns Mfg. Corp., E. Reed, Brooklyn, N. Y.
Divine Brothers Company, Utica, N. Y.
Gumm Chemical Co., Frederick, Kearny, N. J.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harrison & Co., Inc., Haverhill, Mass.
Lasalco, Inc., St. Louis, Mo.
Lea Mfg. Co., The, Waterbury, Conn.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.

BURRING COMPOUNDS

Puritan Mfg. Co., The, Waterbury, Conn.
Roberts Rouge Co., The, Stratford, Conn.
Stevens, Inc., Frederic B., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.

BURRING MACHINES

Acme Mfg. Co., Detroit, Mich.
Baker Co., M. E., Cambridge, Mass.
Divine Brothers Co., Utica, N. Y.
Packer Machine Co., The, Meriden, Conn.
Stevens, Inc., Frederic B., Detroit, Mich.

CADMIUM SERVICE

Baker Co., M. E., Cambridge, Mass.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio
Kocour Co., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
McGean Chemical Co., Cleveland, Ohio
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

CEMENT—POLISHING WHEEL

Baker Co., M. E., Cambridge, Mass.
Buckingham Products Co., Detroit, Mich.
Divine Brothers Company, Utica, N. Y.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harrison & Co., Inc., Haverhill, Mass.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

CHROMIUM SERVICE

Harshaw Chemical Co., The, Cleveland, Ohio
Kocour Co., Chicago, Ill.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

BUYERS' GUIDE

CLEANERS—METAL—ALKALI

Baker Co., M. E., Cambridge, Mass.
Blakeslee & Co., G. S., Chicago, Ill.
Detrex Corporation, Detroit, Mich.
Enthone Co., New Haven, Conn.
Gumm Chemical Co., Frederick, Kearny, N. J.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Harshaw Chemical Co., The, Cleveland, Ohio
Kocour Co., Chicago, Ill.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons So., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Meaker Co., The, Chicago, Ill.
Magnus Chemical Co., Inc., Garwood, N. J.
Magnuson Products Corp., Brooklyn, N. Y.
Mitchell-Bradford Chemical Co., Bridgeport, Conn.
Oakite Products, Inc., New York, N. Y.
Puritan Mfg. Co., The, Waterbury, Conn.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Phillips Mfg. Co., Chicago, Ill.
Stevens, Inc., Frederic B., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Sulphur Products Co., Greensburg, Pa.
Udylite Corp., The, Detroit, Mich.
Wyandotte Chemicals Corp., Wyandotte, Mich.

CLEANERS—METAL—EMULSION

Baker Co., M. E., Cambridge, Mass.
Detrex Corporation, Detroit, Mich.
Enthone Co., New Haven, Conn.
Gumm Chemical Co., Frederick, Kearny, N. J.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
MacDermid, Inc., Waterbury, Conn.
Magnus Chemical Co., Inc., Garwood, N. J.

CLEANERS—METAL—EMULSION

Magnuson Products Corp., Brooklyn, N. Y.
Oakite Products, Inc., New York, N. Y.
Puritan Mfg. Co., The, Waterbury, Conn.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Phillips Mfg. Co., Chicago, Ill.
Stevens, Inc., Frederic B., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Wyandotte Chemicals Corp., Wyandotte, Mich.

CLEANERS—METAL—SOLVENT

A.B.C. Chemical Co., Waterbury, Conn.
Baker Co., M. E., Cambridge, Mass.
Blakeslee & Co., G. S., Chicago, Ill.
Chlorine Products Corp., Westvaco, New York, N. Y.
Detrex Corporation, Detroit, Mich.
Gumm Chemical Co., Frederick, Kearny, N. J.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
Maas & Waldstein Co., Newark, N. J.
MacDermid, Inc., Waterbury, Conn.
Magnus Chemical Co., Inc., Garwood, N. J.
Magnuson Products Corp., Brooklyn, N. Y.
Mechanical Process Co., South Orange, N. J.
Mitchell-Bradford Chemical Co., Bridgeport, Conn.
Oakite Products, Inc., New York, N. Y.
Puritan Mfg. Co., The, Waterbury, Conn.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Phillips Mfg. Co., Chicago, Ill.
Stevens, Inc., Frederic B., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.
Wyandotte Chemicals Corp., Wyandotte, Mich.

BUYERS' GUIDE

CLEANERS—METAL—SOLVENT

Zapon Division, Atlas Powder Co., Stamford, Conn.

DEBURRING MACHINES

Divine Brothers Co., Utica, N. Y.
Lea Mfg. Co., The, Waterbury, Conn.
Packer Machine Co., The, Meriden, Conn.
Stevens, Inc., Frederic B., Detroit, Mich.
Sturgis Products Co., The, Sturgis, Mich.

DEGREASING EQUIPMENT—SOLVENT

A.B.C. Chemical Co., Waterbury, Conn.
Baker Co., M. E., Cambridge, Mass.
Blakeslee & Co., G. S., Chicago, Ill.
Detrex Corporation, Detroit, Mich.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
International Conveyor & Washer Corp., Detroit, Mich.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Magnus Chemical Co., Inc., Garwood, N. J.
Mechanical Process Co., South Orange, N. J.
Phillips Mfg. Co., Chicago, Ill.
Stevens, Inc., Frederic B., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corporation, The, Detroit, Mich.

DRYERS

Blakeslee & Co., G. S., Chicago, Ill.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
Magnus Chemical Co., Inc., Garwood, N. J.
Meaker Co., The, Chicago, Ill.
Stutz Mfg. Co., Geo. A., Chicago, Ill.

DRYERS—CENTRIFUGAL

Baker Co., M. E., Cambridge, Mass.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Meaker Co., The, Chicago, Ill.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

EQUIPMENT, PLATING—AUTOMATIC AND SEMI-AUTOMATIC

Baker Co., M. E., Cambridge, Mass.
Ceilcote Co., The, Cleveland, Ohio
Enthone Co., New Haven, Conn.
Gumm Chemical Co., Frederick, Kearny, N. J.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Hay Co., Jacob, Chicago, Ill.
Heil Engineering Co., Cleveland, Ohio
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Meaker Co., The, Chicago, Ill.
Stevens, Frederic B., Inc., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

FILTERS

Alsop Engineering Corp., Milldale, Conn.
Baker Co., M. E., Cambridge, Mass.
Enthone Co., New Haven, Conn.
Gumm Chemical Co., Frederick, Kearny, N. J.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Industrial Filter & Pump Mfg. Co., Chicago, Ill.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.

BUYERS' GUIDE

FILTERS

Meaker Co., The, Chicago, Ill.
Sparkler Mfg. Co., Mundelein, Ill.
Stevens, Inc., Frederic B., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

GENERATORS

Baker Co., M. E., Cambridge, Mass.
Gumm Chemical Co., Frederick, Kearny, N. J.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
MacDermid, Inc., Waterbury, Conn.
Meaker Co., The, Chicago, Ill.
Stevens, Frederic B., Inc., Detroit, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

GLUE—POLISHING WHEEL

Advance Polishing Wheels, Inc., Chicago, Ill.
Baker Co., M. E., Cambridge, Mass.
Buckingham Products Co., The, Detroit, Mich.
Burns Mfg. Corp., E. Reed, Brooklyn, N. Y.
Divine Brothers Company, Utica, N. Y.
Hanson-Van Winkle-Munning Co., Matawan, N. J.
Lasalco, Inc., St. Louis, Mo.
Lea Mfg. Co., The, Waterbury, Conn.
L'Hommedieu & Sons Co., Chas. F., Chicago, Ill.
Stutz Mfg. Co., Geo. A., Chicago, Ill.
Udylite Corp., The, Detroit, Mich.

GRINDERS—BELT

Divine Brothers Co., Utica, N. Y.
Hammond Machinery Builders, Inc., Kalamazoo, Mich.
Lasalco, Inc., St. Louis, Mo.
Stutz Mfg. Co., Geo. A., Chicago, Ill.

GRINDING MACHINES SPECIAL

Acme Mfg. Co., Detroit, Mich.
Divine Brothers Co., Utica, N. Y.
Packer Machine Co., The, Meriden, Conn.

GRINDERS PORTABLE

Hammond Machinery Builders, Inc., Kalamazoo, Mich.
Stutz Mfg. Co., Geo. A., Chicago, Ill.

LACQUER

Egyptian Lacquer Mfg. Co., The, New York, N. Y.
Maas & Waldstein Co., Newark, N. J.
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REVIEW

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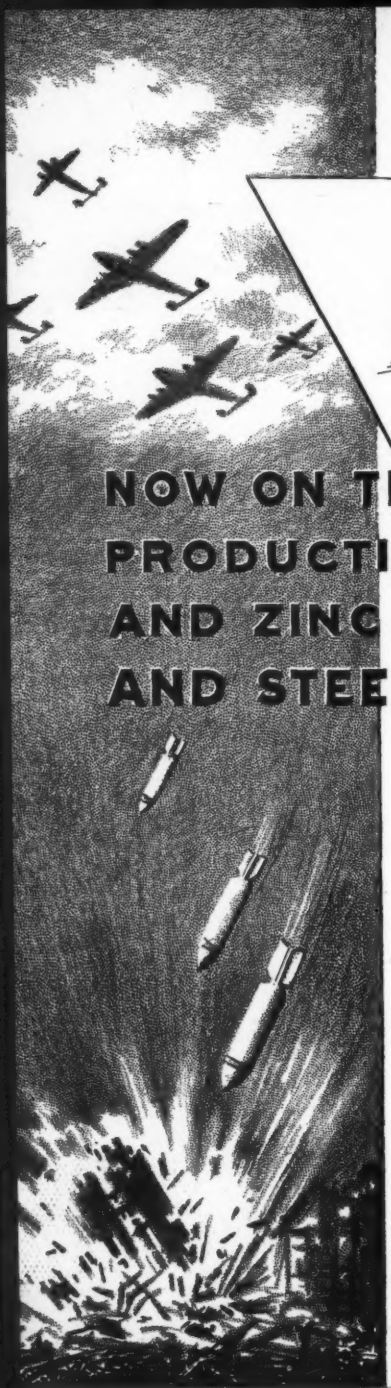
DECEMBER — — — 1943



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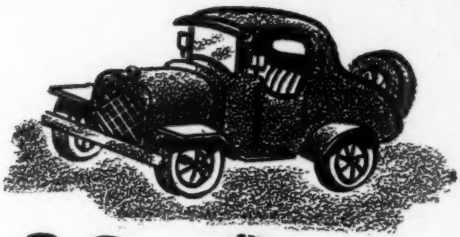

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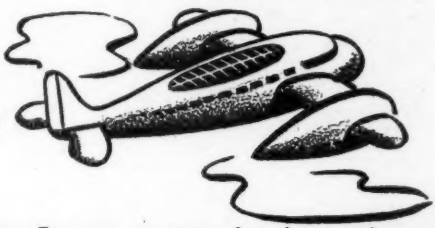

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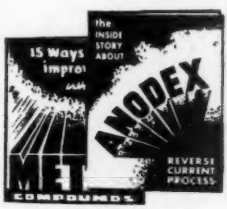

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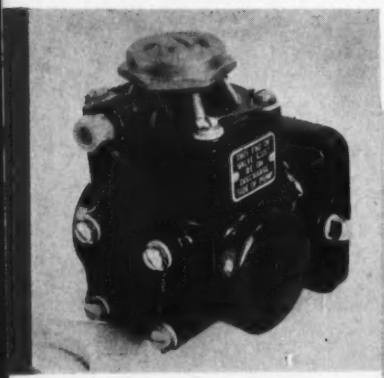

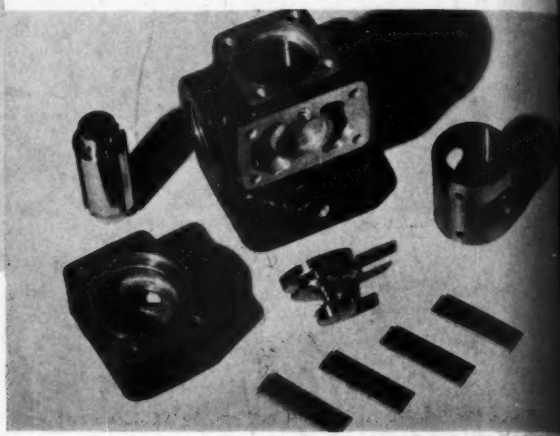

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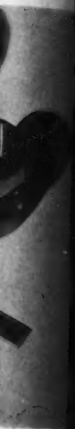

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